

Exhibit A

Electronic Acknowledgement Receipt

EFS ID:	1662331
Application Number:	09497383
International Application Number:	
Confirmation Number:	7431
Title of Invention:	System and method for scanning a document in client/server environment
First Named Inventor/Applicant Name:	David L. Bahr
Customer Number:	826
Filer:	Jon Matthew Jurgovan/shelley victoria
Filer Authorized By:	Jon Matthew Jurgovan
Attorney Docket Number:	7204
Receipt Date:	06-APR-2007
Filing Date:	03-FEB-2000
Time Stamp:	17:20:11
Application Type:	Utility

Payment information:

Submitted with Payment	yes
Payment was successfully received in RAM	\$ 180
RAM confirmation Number	520
Deposit Account	160605
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 and 1.17	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)	Multi Part / .zip	Pages (If appl.)
1	Information Disclosure Statement (IDS) Filed	258663USIDS.pdf	659230	no	4

Warnings:

Information:

2	NPL Documents	258663Application2400010.pdf	911197	no	4
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Warnings:

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Information:

3	Foreign Reference	EP0867817.pdf	2374084	no	47
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Warnings:

Information:

4	Fee Worksheet (PTO-06)	fee-info.pdf	8200	no	2
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eFiled Application Information

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Application Type	Utility

Application Details

Submitted Files	Page Count	Document Description	File Size	Warnings
258663USIDS.pdf	4	Information Disclosure Statement (IDS) Filed	659230 bytes	◆ PASS
258663Application2400010.pdf	4	NPL Documents	911197 bytes	▲ WARNINGS
The page size in the PDF is too large. The pages should be 8.5 x 11 or A4. If this PDF is submitted, the pages will be resized upon entry into the Image File Wrapper and may affect subsequent processing				
EP0867817.pdf	47	Foreign Reference	2374084 bytes	◆ PASS
fee-info.pdf	2	Fee Worksheet (PTO-06)	8200 bytes	◆ PASS

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)	Application Number		09497383	
	Filing Date		2000-02-03	
	First Named Inventor	Bahr		
	Art Unit	2143		
	Examiner Name	Neurauter, George C.		
Attorney Docket Number		047307/258663		

U.S. PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear
	1	5956487		1999-09-21	Venkatraman et al	

If you wish to add additional U.S. Patent citation information please click the Add button.

U.S. PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear
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FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T ⁵
	1	0867817	EP	A2	1999-09-30	Shima et al		<input type="checkbox"/>

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NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T ⁵

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	09497383
Filing Date	2000-02-03
First Named Inventor	Bahr
Art Unit	2143
Examiner Name	Neurauter, George C.
Attorney Docket Number	047307/258663

1	Art cited from attached Canadian Office Action dated 16, 2006.	<input type="checkbox"/>
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If you wish to add additional non-patent literature document citation information please click the Add button

EXAMINER SIGNATURE

Examiner Signature		Date Considered	
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	09497383
Filing Date	2000-02-03
First Named Inventor	Bahr
Art Unit	2143
Examiner Name	Neurauter, George C.
Attorney Docket Number	047307/258663

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

- ☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

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- ☐ See attached certification statement.
- ☒ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.
- ☐ None

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Jon M. Jurgovan/	Date (YYYY-MM-DD)	2007-04-06
Name/Print	Jon M. Jurgovan	Registration Number	34633

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(11) **EP 0 867 817 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
30.09.1998 Bulletin 1998/40

(51) Int Cl.⁶: **G06F 17/30, H04N 1/21,
G06T 17/00**

(21) Application number: **98302288.0**

(22) Date of filing: **25.03.1998**

(84) Designated Contracting States:
**AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC
NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

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(30) Priority: **25.03.1997 JP 72214/97**
23.01.1998 JP 11407/98

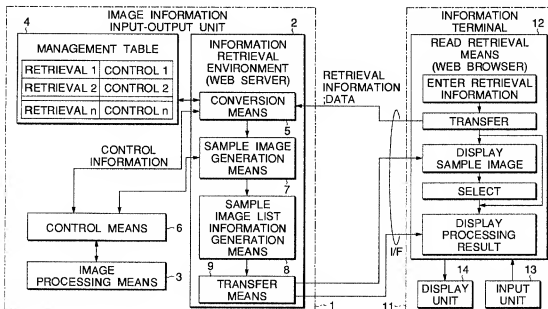
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(54) **Image information input-output unit, image information input-output unit control method, and image information processing system**

(57) A web browser section provided in a scanner comprises a management table for relating URLs and setup values to each other and managing them and a URL interpretation section. A URL entered from a web

browser installed in an information terminal is converted into a setup value by the URL interpretation section. The setup value is set in a drive control section through a setting section, whereby an image is read under a desired read condition.

FIG.1



EP 0 867 817 A2

Description

BACKGROUND OF INVENTION

This invention relates to an image information input-output unit for performing input-output processing of image information, such as a scanner, a printer, a copy machine, a facsimile machine, a digital still-video camera, or a digital video camera, an image information input-output unit control method, and an image information processing system

For example, a scanner for reading an image on a paper medium, a printer for printing on a print recording medium based on input print data, or the like is known as an image information input-output unit. The user can obtain desired image data, for example, by transferring image data between an information terminal such as a personal computer and an image information input-output unit.

That is, with a scanner, image data read through the scanner and converted into digital data by the scanner can be used in application programs of a database, document preparation (word processing) software, etc. With a printer, print data prepared by an application program of document preparation (word processing) software, etc., is input to the printer, whereby any desired print result can be obtained.

To conventionally use an image information input-output unit, driver software to use the image information input-output unit needs to be previously installed in an information terminal. That is, for example, with the scanner, the information terminal needs to be provided with a program to read image data into the information terminal. With the printer, the information terminal needs to have a program to transfer print data to the printer.

By the way, the driver software required to use image information input-output units vary from one image information input-output unit to another. That is, the driver software used for the scanner differs from that used to the printer. The driver software for one scanner and that for another similar scanner vary depending on the scanner manufacturer, model, etc.

Therefore, the user must previously install proper driver software in the information terminal in response to his or her image information input-output unit. However, it is intricate and low in operating ease to install driver software, etc. For example, to properly use both a color inkjet printer and a monochrome laser printer in response to print, the driver software must also be changed, leading to low operability and ease of use. Particularly, in recent years, image information input-output units have been often shared through various networks such as a LAN (local area network) and an intranet. To share an image information input-output unit among a number of information terminals connected by a network, the driver software must be installed in response to the shared image information input-output unit.

It is therefore an object of the invention to provide an image information input-output unit, an image information input-output unit control method, and an image information processing system that can produce desired image information input-output processing results by separating control information for executing image processing and information entered from an information terminal (retrieval information, command information, or resource request information) for eliminating the need for machine (device)-dependent driver software and enabling seamless operation. It is another object of the invention to provide an image information input-output unit, an image information input-output unit control method, and an image information processing system that can be controlled by storing control information required for performing image information input-output processing in the image information input-output unit and indirectly specifying the control information by entering information from an information terminal. It is still another object of the invention to provide an image information input-output unit, an image information input-output unit control method, and an image information processing system that can perform various types of image information processing seamlessly under a unified operation environment without using special driver software by using a hypertext information retrieval environment (or a web server function) and read retrieval means (or a web browser) that can execute two-way communication with the information retrieval environment.

SUMMARY OF INVENTION

To the ends, control information required for causing image processing means to perform predetermined image information processing is not issued from an information terminal and is specified indirectly by entering retrieval information or command information from the information terminal, thereby causing an image information input-output unit according to the invention to perform desired image information input-output processing. The invention will be discussed with reference to Fig. 1, schematic representation of problem solution means.

According to the first aspect of the invention, there is provided an image information input-output unit 1 comprising a hypertext information retrieval environment 2 for driving image processing means 3 based on control information, thereby performing input-output processing of image information, characterized by a management table 4 for managing retrieval information and the control information in correspondence with each other, conversion means 5 for looking up in the management table 4 based on the entered retrieval information and converting the retrieval information into predetermined control information, and control means 6 for controlling the operation of the image processing means 3 based on the control information into which the retrieval

information is converted by the conversion means 5.

The "image information input-output unit 1" is a concept including image information input units, image information output units, and image information input-output units. The image information input units include a scanner, a film scanner, a digital still-video camera, a digital video camera, etc., for example. The image information output units include a printer, a plotter, a display, etc., for example. The image information input-output units include a facsimile machine, for example. The "hypertext information retrieval environment 2" means an environment to enable the user to retrieve and read a hypertext comprising information resources related to each other; specifically, it corresponds to a WWW (World Wide Web) server function, for example. The "image processing means 3" means for inputting, outputting, or inputting-outputting image information; specifically, it corresponds to a print engine, an image data read section, etc., for example. The "control information" means information required for controlling the operation of the image processing means 3; specifically, it contains setup values of color or monochrome specification, read resolution specification, etc., for example. Control code, etc., other than the setup values may be included. The "retrieval information" is information required for retrieving information resources under the hypertext information retrieval environment 2; specifically, it corresponds to a URL (Uniform Resource Locator), etc., for example.

When retrieval information is entered from the outside of the image information input-output unit 1, the conversion means 5 looks up in the management table 4 and converts the retrieval information into predetermined control information. If the entered retrieval information does not correspond to control information, it is processed as normal retrieval information. For example, when a URL of "http://xxx/action/300dpi/" is entered, if "action/300dpi" is previously related to the control information meaning "read image at read resolution 300 dpi" in the management table 4, the URL is converted into control information by the conversion means 5, whereby the image read operation at 300 dpi is executed. On the other hand, for example, when a URL of "http://xxx/status.html/" is entered, if "status.html" is not registered in the management table 4, the URL is handled as normal retrieval information. If a document file named "status.html" exists in the information retrieval environment 2, the document file is called. The "xxx" in the URL stands for the IP address assigned to the image information input-output unit or the name of a machine containing a web server.

Retrieval information is used to indirectly specify control information, whereby predetermined image information input-output processing is performed. Thus, if the user uses an information terminal that can issue retrieval information for using the hypertext information retrieval environment 2, he or she can use the image information input-output unit without installing special

driver software. Since control information is specified by entering retrieval information, the operation environment need not be changed, so that various types of image information processing can be performed seamlessly.

According to the second aspect of the invention, the management table 4 relates a sample image generation request to predetermined retrieval information for managing them, and the information retrieval environment 2 comprises sample image generation means 7 for generating prediction results of image information input-output processing based on a plurality of preset control information pieces as sample images if the sample image generation request occurs as the predetermined retrieval information is entered, sample image list information generation means 8 for generating sample image list information for relating the retrieval information pieces corresponding to the sample images to the sample images and listing the same, and transfer means 9 for transferring the sample image list information to the retrieval-information entry source.

The "sample image" means an image generated by predicting the input-output result of actually performed image information processing. The processing result is checked by seeing the sample image before actual image information input-output processing is performed under the conditions set according to the control information. The sample image corresponds to a small image (thumbnail image) provided by thinning out image information provided by performing actual image information processing.

Retrieval information pieces are related to the sample images provided according to control information pieces and they are transferred, whereby the user at the retrieval information entry source (information terminal) can compare the sample images and select any desired processing result. Since the retrieval information pieces corresponding to the image information processing items are related to the sample images, the user can specify the related retrieval information piece for obtaining desired image information input-output processing result.

According to the third aspect of the invention, there is provided a control method for controlling an image information input-output unit 1 comprising a hypertext information retrieval environment 2 and a management table 4 for managing retrieval information and control information in correspondence with each other for driving image processing means 3 based on the control information, thereby performing input-output processing of image information, the control method comprising the steps of receiving the retrieval information, looking up in the management table 4 based on the received retrieval information and converting the retrieval information into predetermined control information, controlling the operation of the image processing means 3 based on the control information into which the retrieval information is converted, and transferring image information



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RECEIVED OCT 18 2006

October 16, 2006

Application No. : 2,400,010
Owner : INTERTECH INFORMATION MANAGEMENT, INC.
Title : **SYSTEM AND METHOD FOR SCANNING A DOCUMENT IN
CLIENT/SERVER ENVIRONMENT**
Classification : H04N 1/00 (2006.01)
Your File No. : 7204-38549
Examiner : Gilbert Jean

YOU ARE HEREBY NOTIFIED OF A REQUISITION BY THE EXAMINER IN ACCORDANCE
WITH SUBSECTION 30(2) OF THE PATENT RULES. IN ORDER TO AVOID ABANDONMENT
UNDER PARAGRAPH 73(1)(A) OF THE PATENT ACT, A WRITTEN REPLY MUST BE
RECEIVED WITHIN **SIX MONTHS** AFTER THE ABOVE DATE.

This application has been examined taking into account applicant's correspondence received in
this office on October 12, 2005.

The number of claims in this application is 71.

A further search of the prior art has revealed the following:

References applied

European Patent Application

867,817 Sep. 30, 1998 G06F 17/30 Shima et al.

United States Patent

5,956,487 Sep. 21, 1999 G06F 13/14 Venkatraman et al.

Shima et al. disclose a scanner that provides a web browser section wherein an entered URL is
converted into a setup value by the URL interpretation section. The setup values are set in a
drive control section, whereby an image is read under a desired read condition.

Canada

OPIC



CIPO

Venkatraman et al. disclose a web access functionality that is embedded in a device to enable enhanced user interface functions for the device. A web server in the device provides access to the user interface functions for the device through a device web page.

Obviousness

The subject of the present application relates to a method of transmission of data between client devices and servers coupled by one or more networks. The method can be used to transfer documents in electronic form between parties in mortgage lending transactions or in court proceedings, for example.

Shima et al. teach an image information input-output used to perform input-output processing of image information, such as a scanner, a printer, a copy machine, a facsimile machine, a digital still-video camera. The hypertext information retrieval environment allows the user to use the image information input-output unit without installing special driver software.

Venkatraman et al. teach a method of embedding web access functionality into a device that includes a web server that provides a device web page. The device includes an embedded network interface that enables access to the device web page by a web browser.

In the last correspondence, it was argued that the references applied do not disclose generating a display within a web browser from a HTML document in which the display includes a document display portion, an index portion and a control portion wherein no specific additional software is required.

Claim 1 recites a method comprising the step of :

- generating a display based on a hypertext mark-up language (HTML) document stored in a client device using a web browser of a user interface of the client device.

Shima et al. disclose an image information input-output wherein a user accesses an information terminal that can issue retrieval information when using the hypertext information retrieval environment. Therefore, the user can access the image information input-output without installing special driver software (column 3, lines 55 to 58).

Venkatraman et al. disclose a method of embedding web access functionality into a device. A user of the web browser may access the user interface functions for the device through the device web page (column 2, lines 19 to 26).

- a document display portion including a display of document data received from a scanner coupled to the client device.

Shima et al. disclose an image information input-output unit of a scanner that comprises a display unit for displaying the result of reading the information retrieval environment (column 5, lines 49 to 58).

- a control portion for generating a start scan signal to initiate scanning of the document with the scanner to generate the document data.

Shima et al. disclose an image information input-output that comprises control information means for controlling the operation of the image processing means (column 3, lines 19 to 29).

Venkatraman et al. disclose a method of embedding web access functionality into a device wherein some of the user interface functions enable control functions of the device (column 8, lines 16 to 23).

Thus, claim 1 is obvious since it defines the technical features that are disclosed by *Shima et al.* and *Venkatraman et al.*, namely, generating a display based on a hypertext markup language (HTML) document stored in a client device using a web browser of a user interface of the client device, a document display portion including a display of document data received from a scanner coupled to the client device, and a control portion for generating a start scan signal to initiate scanning of the document with the scanner to generate the document data.

Claims 9, 26, 38, 47, 51 and 53, which are directed to the same subject matter as claim 1, are also found to be obvious.

Dependent claims 2 to 8, 10 to 25, 27 to 37, 39 to 46, 48 to 50, 52 and 54 to 71, which further define the subject matter of claims 1, 9, 26, 38, 47, 51 and 53, fail to introduce any inventive limitations and are also considered obvious.

Although *Venkatraman et al.* do not disclose a document display portion including a display of document data received from a scanner, *Shima et al.* disclose an image information input-output unit of a scanner that comprises a display unit for displaying the result of reading the information retrieval environment.

Therefore, claims 1 to 71 do not comply with section 28.3 of the *Patent Act*. The subject matter of these claims would have been obvious on the claim date to a person skilled in the art or science to which they pertain having regard to *Shima et al.* and *Venkatraman et al.*, in light of the common knowledge disclosed by *Shima et al.*

In view of the foregoing defects, the applicant is requisitioned, under subsection 30(2) of the *Patent Rules*, to amend the application in order to comply with the *Patent Act* and the *Patent Rules* or to provide arguments as to why the application does comply.

Under section 34 of the *Patent Rules*, any amendment made in response to this requisition must be accompanied by a statement explaining the nature thereof, and how it corrects each of the above identified defects.

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US005956487A

United States Patent

Venkatraman et al.

[19]

[11] Patent Number:

5,956,487

[45] Date of Patent:

Sep. 21, 1999

- [54] **EMBEDDING WEB ACCESS MECHANISM IN AN APPLIANCE FOR USER INTERFACE FUNCTIONS INCLUDING A WEB SERVER AND WEB BROWSER**

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- [21] Appl. No.: **08/740,289**

- [22] Filed: **Oct. 25, 1996**

- [51] Int. Cl.⁶ **G06F 13/14**; G06F 15/46; G06F 17/00; H04M 11/00

- [52] U.S. Cl. **395/200.48**; 395/200.48; 395/200.58; 395/200.32; 395/200.33; 395/200.59; 395/200.38; 345/335; 345/349; 364/138; 364/221.2; 340/825.08; 340/825.06; 340/825.07

- [58] Field of Search 707/10; 395/200.32; 395/200.59; 200.48; 200.33; 200.38; 200.58; 345/335; 349; 340/825.08; 825.06; 825.07; 364/138; 221.2

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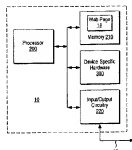
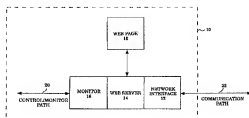
Primary Examiner—Zarni Maung

Assistant Examiner—William D. Thomson

[57]

ABSTRACT

Web access functionality is embedded in a device to enable low cost widely accessible and enhanced user interface functions for the device. A web server in the device provides access to the user interface functions for the device through a device web page. A network interface in the device enables access to the web page by a web browser such that a user of the web browser accesses the user interface functions for the device through the web page.

26 Claims, 6 Drawing Sheets

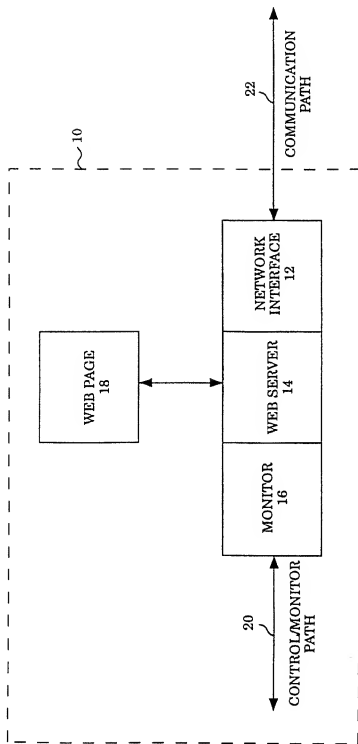
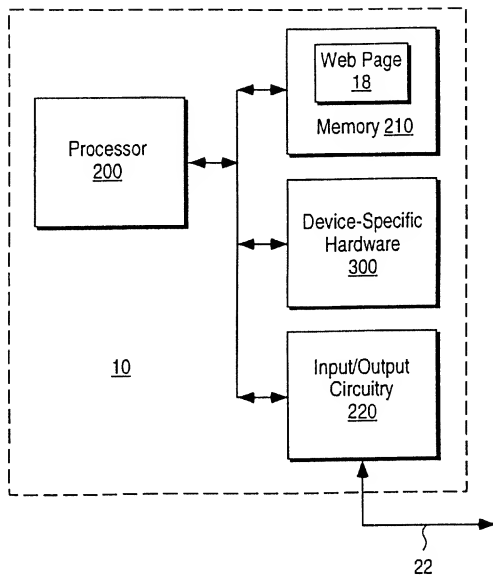


Figure 1a

FIG. 1B



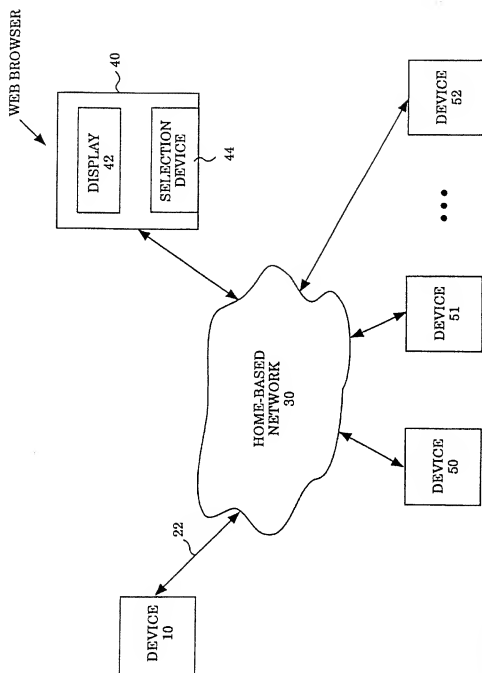


Figure 2

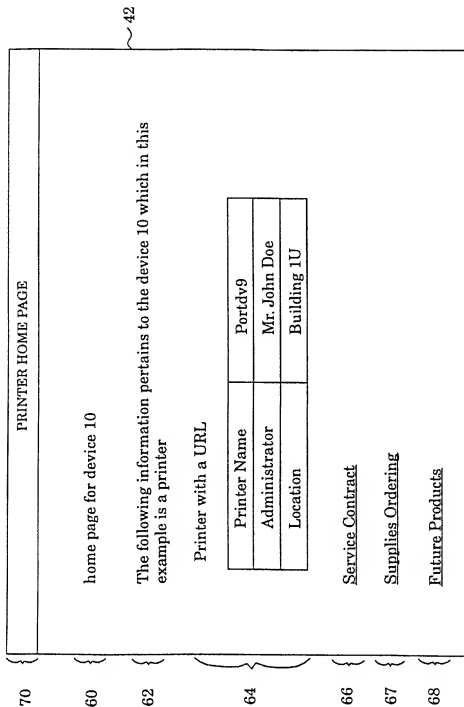


Figure 3

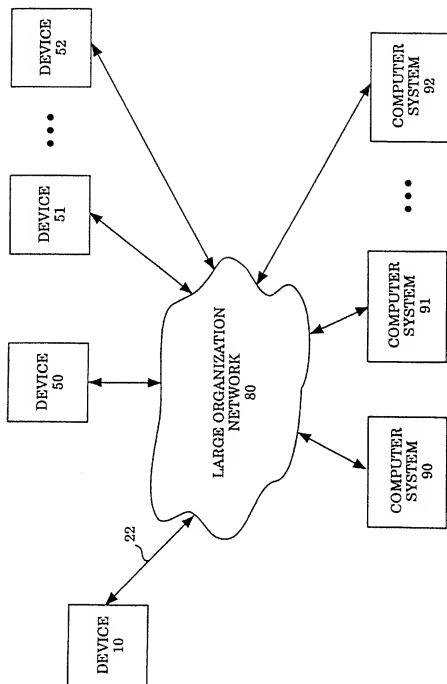


Figure 4

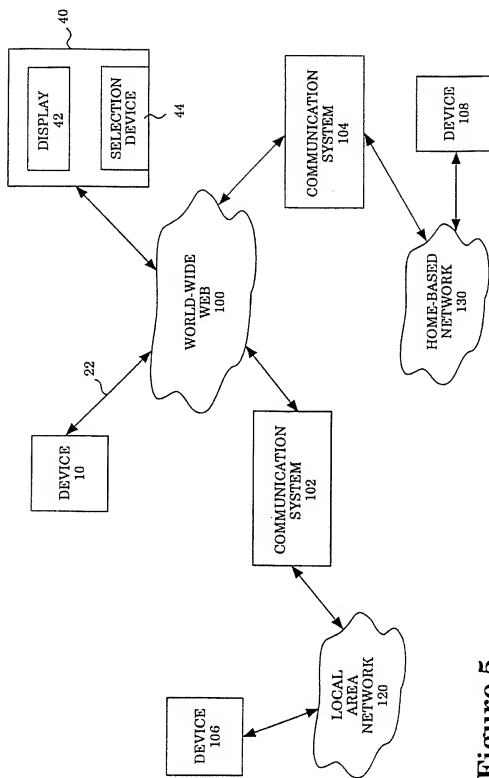


Figure 5

EMBEDDING WEB ACCESS MECHANISM IN AN APPLIANCE FOR USER INTERFACE FUNCTIONS INCLUDING A WEB SERVER AND WEB BROWSER

BACKGROUND OF THE INVENTION

1. Field of Invention

The present invention pertains to the field of user interfaces for devices. More particularly, this invention relates to embedding web access functionality into devices to provide enhanced and widely accessible user interface functions.

2. Art Background

A wide variety of devices including office equipment, home-based equipment, and lab equipment, as well as a variety of other types of devices commonly provide device specific user interface functions. Such devices may also be referred to as gadgets. Office equipment includes, for example, printers, fax machines, copiers, and various types of communication and telephony devices. Home-based devices include home entertainment equipment such as televisions and video and audio players and recorders as well as security systems, automobiles, appliances, thermostats, and hot tubs. Lab equipment includes measurement devices such as oscilloscopes, spectrum analyzers and other types of measurement equipment as well as networking equipment.

The user-interface mechanisms of such devices commonly include relatively simple and low cost user input and display mechanisms. Such simple mechanisms may include, for example, light emitting elements such as LED/LCD elements as well as various types of simple input buttons or switches. Such simple mechanisms are typically constructed to be low cost to minimize the overall cost of such devices. In addition, such mechanisms are usually compact and enable relatively small sizes for such devices. Unfortunately, such simple user interface mechanisms severely limit the range and flexibility of the user interface functions provided by such devices.

The user-interface functions of such a device may be enhanced by the implementation of a screen-based user interface mechanism within the device. For example, such a device may include a display screen, and a rendering processor along with appropriate software for generating a rich graphical user interface suitable for the particular type of device. However, such screen displays and rendering mechanisms are usually expensive and increase the overall cost of the device. Such high costs are typically unsuitable for lower cost devices targeted for a relatively large mass market. Moreover, display screens and associated hardware may be too bulky for the size constraints of many devices.

A screen-based user interface may be provided for a device using an external computer system. For example, the device may be connected to the computer system through either a standard connection such as a serial or parallel port connection or through a specialized hardware interface. The external computer system usually executes a set of software for communication and user interface to the device. The external computer system may implement a screen-based user interface for the device. The external computer system may also execute web server software that enables external web browsers to access the computer system and in turn the user interface of the device.

Unfortunately, such an external computer system greatly increases the cost of providing a screen-based user interface for a device. In addition, such prior computer system based

solutions usually require the development of specialized software for each particular type of device. Moreover, such specialized software for a particular device from a particular manufacturer must typically be developed for differing types of computer system platforms. Such a variety of differing software for differing platforms greatly complicates the task of providing support for the devices. Furthermore, the development and support costs of such a variety of software usually increase the overall cost of providing a screen based user interface for such devices.

SUMMARY OF THE INVENTION

A solution for providing widely accessible, low cost, and enhanced user interface functions for a device is disclosed. The solution involves embedding web access functionality into the device including a web server that provides a device web page. The device includes an embedded network interface that enables access to the device web page by a web browser. A user of the web browser accesses the user interface functions for the device through the device web page. The web server functionality may be implemented with existing circuitry in a device, such as an existing processor, memory, and input/output circuitry that normally perform device-specific functions, thereby avoiding the extra cost and space required for dedicated web server hardware for the device.

The web server functionality embedded in the device enables device user interface access via a variety of communication mechanisms including the world wide web portion of the Internet. The costs of providing screen based user interface mechanisms are exported away from the device and do not require an external computer to provide a device web server. The methods and mechanisms disclosed herein provide screen based user-friendly interfaces to a wide variety of devices without the necessity to develop expensive hardware and software applications for differing devices. The present methods and mechanisms employ web technology so that access to a device user interface is independent of the computer system platform employed and independent of the web browser software executed and independent of the location of the user.

The user interface information is packaged using the Hyper-Text Markup Language (HTML) and is transported according to the Hyper-Text Transfer Protocol (HTTP). The HTML and HTTP protocols enable communication with existing web browsers independent of the platform that executes the web browser. The present techniques avoid the need of an industry-wide Application Programming Interface (API) to unify the control and use of equipment.

Other features and advantages of the present invention will be apparent from the detailed description that follows.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention is described with respect to particular exemplary embodiments thereof and reference is accordingly made to the drawings in which:

FIGS. 1a-1b illustrate a device with embedded web access functionality that provides device-specific user interface functions through a device web page;

FIG. 2 shows a home-based network that enables a web browser to access the user interface functions through the device web page;

FIG. 3 illustrates an example device web page for a printer device;

FIG. 4 shows a large organization network or intranet that enables access to the device web pages of differing devices;

FIG. 5 illustrates access to device web pages through the Internet world-wide web.

DETAILED DESCRIPTION

FIG. 1a illustrates a device 10 with embedded web access functionality that provides device-specific user interface functions. The device 10 includes a network interface 12 and a web server 14 along with a monitor 16. The network interface 12 enables communication via a communication path 22. The monitor 16 controls various device-specific functions of the device 10 and monitors a set of information pertaining to the device 10 via a control/monitor path 20. The web server 14 provides web server functions to web clients via the communication path 22. The web server 14 provides web server functions according to the Hyper-Text Transfer Protocol (HTTP).

The web server 14 receives HTTP commands through the network interface 12 that specify a predetermined Universal Resource Locator (URL) for the device 10. The HTTP commands may be used by web clients to read information from the device 10 such as device status information. The HTTP commands may also be used to transfer information to the device 10 such as information that controls the functions or operating states of the device 10. Such HTTP commands include HTTP GET, HTTP POST, and HTTP PUT commands.

In response to an HTTP command targeted for the device 10, the web server 14 generates a web page 18 that defines a set of user interface functions for the device 10. The web page 18 is a Hypertext Markup Language (HTML) file. The network interface 12 transfers the web page 18 to a requesting HTTP client via the communication path 22.

The web server 14 generates the web page 18 dynamically to reflect the updated state of the information pertaining to the device 10 that is maintained by the monitor 16. The web page 18 may also define control buttons according to the HTTP protocol that enable various control functions for the device 10 to be initiated from a web client via the communication path 22. The web page 18 may contain text, images, multimedia files, forms, tables or any object type supported by the HTTP and HTML protocols.

In addition, the web page 18 may contain one or more URLs that specify additional web pages located within the device 10. The web page 18 may also contain one or more URLs that specify additional web pages located elsewhere, i.e. external to the device 10. The additional web pages external to the device 10 may be located, for example, on a local communication network or on the Internet world wide web.

The device 10 represents a wide variety of devices including devices such as printers, fax machines, copiers, communication and telephony devices, home entertainment devices such as televisions, video and audio devices as well as appliances such as refrigerators and washing machines, security systems, automobiles, and hot tubs. The device 10 also represents a variety of measurement instruments including oscilloscopes, and spectrum analyzers and other types of measurement devices. In addition, the device 10 represents a variety of computer peripheral devices including mass storage units such as rotating media storage units.

The communication path 22 represents any communication means that is capable of transferring HTML files according to the HTTP web protocol. The communication path 22 may be realized by a wide variety of communication mechanisms including local area networks, telephone lines including cellular telephone links, serial communication

links, parallel communication links, power line communication links, and radio and infrared communication links. The communication path 22 may also be a direct Internet connection to the world-wide web.

FIG. 1b is a hardware block diagram of the device 10. The device 10 includes a processor 200, a memory 210, a set of device-specific hardware 300 along with a set of input/output circuitry 220 that enables communication via the communication path 22. The processor 200 performs device-specific functions for the device 10 in combination with the device-specific hardware 300. The processor 200 is also employed to provide web server functionality in the device 10. In one embodiment, the processor 200 stores the web page 18 in the memory 210 which may also be used to store information associated with normal device-specific functions.

In one embodiment, the device 10 is a printer device wherein the processor 200 and the memory 210 perform image rendering functions and the device-specific hardware 300 includes printer hardware and associated circuitry and wherein the input/output circuitry 220 provides network access to the printer device 10. The web server functionality is embedded into the printer device 10 by providing software or firmware for the processor 200 and by utilizing space available in the memory 210 and by using the existing input/output circuitry 220 such as Ethernet circuitry to transfer HTML files.

In another embodiment, the device 10 is a video player/recorder wherein the processor 200 and the memory 210 perform functions for reading video and audio information from and writing video and audio information to a storage media such as magnetic tape or an optical storage media. The device-specific hardware 300 includes media actuation hardware such as motors and magnetic heads and associated circuitry for reading and imparting information onto the storage media. The web server functionality is embedded into the video device 10 by providing software or firmware for the processor 200 and by utilizing space available in the memory 210 and by adding the input/output circuitry 220 to the video device 10.

In yet another embodiment, the device 10 is a washing machine wherein the processor 200 and the memory 210 perform functions for controlling wash cycles. The device-specific hardware 300 includes hardware such as motors, valves, sensors, and associated circuitry. The web server functionality is embedded into the washing machine 10 by providing software or firmware for the processor 200 and by utilizing space available in the memory 210 and by adding the input/output circuitry to the video device 10.

The web server functionality for the device 10 includes software executed by the processor 200 that services the HTTP protocol and that generates HTML formatted files. The web page 18 in one embodiment is stored in the memory 210 or may be generated on the fly. The processor 200 also executes communication software that drives the input/output circuitry 220 and provides the functionality of the network interface 12. In addition, the processor 200 executes software that performs control and information monitoring and logging functions of the monitor 16.

In another embodiment, the web server functions of the device 10 are implemented on a single integrated circuit chip including a processor and memory for holding software for servicing the HTTP protocol. In such an embodiment, the hardware portion of the network interface 12 may be implemented on the same integrated circuit chip as the processor or may be external to that chip.

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In yet another embodiment, the web server functions of the device 10 are implemented with a state machine.

In another embodiment, the device 10 is a controller module or control computer contained in an automobile. The input/output circuitry 220 such as cellular transmitter/receiver circuitry enables a web browser to access control and status information for the automobile which is contained in the web page 18.

In another embodiment, the device 10 is a mass storage device such as a disk drive or CD-ROM drive. The input/output circuitry 220 such as local area network interface circuitry enables a web browser to access control and status information for the mass storage device which is contained in the web page 18.

In yet another embodiment, the device 10 is a home-entertainment device such as an audio system. The input/output circuitry 220 such as infrared communication circuitry or power line communication circuitry enables a web browser such as a home computer to access control and status information for the audio system which is contained in the web page 18.

The memory 210 may be a static memory such as read-only memory, a flash memory, or a disk drive or may be a volatile memory such as a random access memory. The web page may be stored in the static memory or the random access memory in the HTML format or may be generated on the fly without being stored in the device 10.

FIG. 2 shows a home-based network 30 that enables a web browser 40 to access the user interface functions of the device 10. The home-based network 30 may be implemented with a variety of communication mechanisms suitable for a home including power line communication links, twisted pair communication links, radio frequency communication links, and infrared communication links.

The web browser 40 includes a display 42 for generating visual objects including text, images, multimedia objects, and graphical user interface objects. The web browser 40 includes a selection device 44 that enables a user to select objects and URL links rendered on the display 42. The web browser 40 may also include an audio capability that enables rendering of audio information to the user.

The home-based network 30 may also enable communication among a set of devices 50-52. The devices 50-52 may include devices such as home appliances, home security systems, home entertainment devices, air-conditioning systems and hot-tubs. Any of the devices 50-52 that implement the device web page mechanisms disclosed herein may provide device specific user interface web pages to the web browser 40 via the home-based network 30.

The web browser 40 may be embodied in a computer system that executes a set of web browser software. Such a computer system with web browser functionality may be realized by any one of a variety of available computer system platforms including Windows platforms, Macintosh platforms, Unix platforms as well as any other platform capable of executing web browser software that provides HTTP client functions and that renders HTML files.

The web browser 40 may also be embodied in a variety of other devices that provide HTTP client functions and that render HTML files. Such devices include specialized hardware designed for television or telephone systems as well as low cost web browser devices and network computers.

A user accesses and controls the user interface functions of the device 10 using the web browser 40. The user enters a URL corresponding to the device 10 into the web browser

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40. In response, the web browser 40 transfers an HTTP command which includes the entered URL over the home-based network 30. The device 10 receives the HTTP command via the communication path 22 and recognizes the URL contained therein.

In one embodiment, the information for the web page 18 is periodically updated by the processor 200 and is stored in HTML format in the memory 210. In such an embodiment, the processor 200 reads the web page 18 from the memory 210 in response to the HTTP command and transfers the web page 18 to the web browser 40 via the home based network 30.

In an alternative embodiment, the processor 200 generates the web page 18 on the fly in response to the HTTP command from the web browser 40. In such an embodiment, the processor 200 obtains information pertaining to the device from the device-specific hardware 300 after receiving the HTTP command and recognizing the URL contained therein. The processor 200 formats the information into the HTML format that defines the web page 18 and transfers the HTML formatted information to the web browser 40 via the home based network 30.

The HTML file is transferred according to the HTTP protocol which specifies the URL corresponding to the web browser 40. The web browser 40 receives the HTML file and renders the web page 18 on the display 42.

The following is an example HTML file that defines the web page 18 in an embodiment wherein the device 10 is a printer device.

```
<TITLE>Printer Home Page</TITLE>
<H1>home page for device 10</H1>
<HR>
The following information pertains to
the device 10 which in this example
is a printer
<table border=
<caption> Printer with a URL </caption>
<TR>
<TD>Printer Name</TD><TD>Port9</TD>
</TR>
<TR>
<TD>Administrator</TD><TD>Mr. John Doe</TD>
</TR>
<TR>
<TD>Location</TD><TD>Building 1U</TD>
</TR>
</TABLE>
<P>
<A HREF = "http://www.hpac.com"> Service Contract</A>
<P>
<A HREF = "http://www.hpapl.com"> Supplies
ordering</A>
<P>
<A HREF = "http://www.hplhp.com"> Future
Products</A>
<P>
</HR>
```

FIG. 3 illustrates the web page 18 for the example HTML file shown above wherein the device 10 is a printer. The web page 18 is rendered on the display 42 by the web browser 40 in response to the example HTML code set forth above. The web page 18 includes a page title 70, a header section 60, a set of ASCII text 62, a table section 64, and a set of hyperlinks 66-68.

The page title 70 is defined by the HTML <TITLE>Printer Home Page</TITLE> coding shown above. The header section 60 is defined by the HTML code <H1>Home Page for device 10</H1> in the HTML file shown above. The ASCII text 62 is the ASCII text contained

in the HTML file shown above. The table section 64 is defined with coding in the HTML file shown above and provides information pertaining to the printer including a printer name, an administrator, and a location for the printer.

The hyperlinks 66-68 defined in the HTML file shown above direct the web browser 40 to other web pages for various printer support functions. For example, the hyperlink 66 "Service Contract" may be selected by the user with the selection device 44 to direct the web browser 40 to the URL "http://www.hpssc.com" for information regarding printer service contracts. Similarly, hyperlinks 67 and 68 provide links to web pages for ordering printer supplies and obtaining information for future printer products from the manufacturer of the printer device 10.

The web page 18 for the printer may also include manuals, parts lists, and other associated publications. These publications may be stored within the device 10 in, for example, a nonvolatile memory, or may be referenced elsewhere via hyperlinks contained in the web page 18. These publications contain dynamic information such as updated manuals as well as new and updated software driver routines for the device 10.

FIG. 4 shows a large organization network 80 that enables access to the device web pages of the device 10 and the devices 50-52. The large organization network 80 may be referred to as an Intranet and may be implemented with a variety of communication mechanisms including local area networks connected together by various types of communication links.

Any one or more of a set of computer systems 90-92 coupled to the large organization network 80 may access the device web pages of the devices 10 and 50-52. The computer systems 90-92 may execute one or more of a variety of available web browser software or may have web browser functions built in.

A user of one of the computer systems 90-92 enters a URL corresponding to the desired one of the devices 10 and 50-52 into the corresponding web browser application. In response, the particular web browser application as an HTTP client transfers an HTTP command that specifies the desired URL over the large organization network 80. The device specified by the HTTP command recognizes the URL contained therein. In response, the targeted device transfers an HTML file that defines its device web page via large organization network 80. The transfer of the HTML file specifies the URL of the originating HTTP client computer system from among the computer systems 90-92. The originating HTTP client computer system recognizes its URL and receives and then renders the device web page to the user.

FIG. 5 illustrates access to device web pages through a direct Internet connection to the world-wide web 100. The web page 18 of the device 10 may be accessed by any web client on the world-wide web 100 including the web browser 40.

In addition, a communication system 102 functions as a communication bridge between the world-wide web 100 and a local area network 120 and a communication system 104 functions as a communication bridge between the world-wide web 100 and a home base network 130. As a consequence, any other HTTP clients coupled to the local area network 120 or the home-base network 130 may access the device web pages in a device 108, a device 106, or the device 10. In addition, the web browser 40 or any HTTP client on the world-wide web 100 may access the device web pages of the devices 106 and 108.

The embedded web server functionality described herein enables a variety of widely accessible device interrogation and control functions for a particular device as well as for sets of devices. For example, a web page may be embedded into each washing machine of a chain of Laundromats wherein an operator from an office computer can determine the machines that require servicing and schedule daily service routing to the Laundromats accordingly.

The foregoing detailed description of the present invention is provided for the purposes of illustration and is not intended to be exhaustive or to limit the invention to the precise embodiment disclosed. Accordingly, the scope of the present invention is defined by the appended claims.

What is claimed is:

1. A web access mechanism of a device, comprising:
 - a web server that generates a device web page, wherein the device web page provides a set of user interface functions for the device, wherein some of the user interface functions enable control functions of the device, wherein the device is a home appliance or automation apparatus or an office appliance or automation apparatus;
 - a network interface that enables access to the device web page by a web browser such that a user of the web browser accesses the user interface functions for the device through the device web page, wherein the web access mechanism is embedded in the device.
2. The web access mechanism of claim 1, wherein the web server receives an HTTP command via the network interface and then generates an HTML file that defines the device web page in response to the HTTP command.
3. The web access mechanism of claim 2, wherein the HTTP command specifies a URL corresponding to the device.
4. The web access mechanism of claim 3, wherein the HTML file contains a set of information pertaining to the device.
5. The web access mechanism of claim 3, wherein the HTML file contains a set of URLs that control a set of predetermined functions for the device wherein each URL may point to a web page located internal to the device or a web page located external to the device.
6. The web access mechanism of claim 3, wherein the HTML file contains a hyperlink to an external web page that specifies additional information pertaining to the device.
7. A user interface method for a device, comprising the steps of:
 - generating a device web page within the device, wherein the device web page provides a set of user interface functions for the device, wherein some of the user interface functions enable control functions of the device, wherein the device is a home appliance or automation apparatus, or an office appliance or automation apparatus;
 - providing access to the device web page from a web browser external to the device such that a user of the web browser accesses the user interface functions for the device through the device web page.
8. The method of claim 7, wherein the step of generating a device web page includes the step of generating an HTML file that defines the device web page in response to an HTTP command received from the web browser.
9. The method of claim 8, wherein the HTTP command specifies a URL corresponding to the device.
10. The method of claim 8, wherein the HTML file contains a set of information pertaining to the device.

11. The method of claim 8, wherein the HTML file contains a set of URLs that control a set of predetermined functions for the device wherein each URL may point to a web page located internal to the device or a web page located external to the device.

12. The method of claim 8, wherein the HTML file contains a hyperlink to an external web page that specifies additional information pertaining to the device.

13. A user interface apparatus of a device, comprising:

means for generating a device web page within the device, wherein the device web page provides a set of user interface functions for the device, wherein some of the user interface functions enable control functions of the device, wherein the device is a home appliance or automation apparatus, or an office appliance or automation apparatus;

means for providing access to the device web page from a web browser external to the device such that a user of the web browser accesses the user interface functions for the device through the device web page, wherein the user interface apparatus is embedded in the device.

14. The apparatus of claim 13, wherein the means for generating a device web page includes means for generating an HTML file that defines the device web page in response to an HTTP command generated by the web browser.

15. The apparatus of claim 14, wherein the HTTP command specifies a URL corresponding to the device.

16. The apparatus of claim 14, wherein the HTML file contains a set of information pertaining to the device.

17. The apparatus of claim 14, wherein the HTML file contains a set of URLs that control a set of predetermined functions for the device wherein each URL may point to a web page located internal to the device or a web page located external to the device.

18. The apparatus of claim 14, wherein the HTML file contains a hyperlink to an external web page that specifies additional information pertaining to the device.

19. A system, comprising:

a device having a web server that generates a device web page wherein the device web page provides a set of user

interface functions for the device and includes a set of information pertaining to the device, the user interface functions enabling control functions of the device which is a home appliance or automation apparatus, or an office appliance or automation apparatus, the device also having a network interface that enables access to the device web page via a communication network, the web server and the network interface being embedded in the device;

a web browser coupled to the communication network wherein a user of the web browser accesses the user interface functions for the device through the device web page.

20. The system of claim 19, wherein the web server in the device receives an HTTP command via the communication network and the network interface and then generates an HTML file that defines the device web page in response to the HTTP command.

21. The system of claim 20, wherein the HTTP command specifies a URL corresponding to the device.

22. The system of claim 20, wherein the HTML file contains a set of URLs that control a set of predetermined functions for the device such that the user of the web browser selects the URLs to control the predetermined functions of the device wherein each URL may point to a web page located internal to the device or a web page located external to the device.

23. The system of claim 20, wherein the HTML file contains a hyperlink to an external web page located elsewhere on the communication network that specifies additional information pertaining to the device.

24. The system of claim 19, wherein the communication network comprises a home-based communication network.

25. The system of claim 19, wherein the communication network comprises a large-organization communication network.

26. The system of claim 19, wherein the communication network comprises the world wide web of the Internet.

* * * * *

Exhibit B

Electronic Acknowledgement Receipt

EFS ID:	1668412
Application Number:	09497383
International Application Number:	
Confirmation Number:	7431
Title of Invention:	System and method for scanning a document in client/server environment
First Named Inventor/Applicant Name:	David L. Bahr
Customer Number:	826
Filer:	Jon Matthew Jurgovan/shelley victoria
Filer Authorized By:	Jon Matthew Jurgovan
Attorney Docket Number:	7204
Receipt Date:	10-APR-2007
Filing Date:	03-FEB-2000
Time Stamp:	13:12:22
Application Type:	Utility

Payment information:

Submitted with Payment	yes
Payment was successfully received in RAM	\$ 180
RAM confirmation Number	1911
Deposit Account	160605
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: Charge any Additional Fees required under 37 C.F.R. Section 1.16 and 1.17	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Filed	258663USIDS.pdf	659294	no	4
Warnings:					
Information:					
2	NPL Documents	OfficeAction.PDF	838413	no	4
Warnings:					
Information:					
3	Foreign Reference	EP0867817.PDF	6900362	no	47
Warnings:					
Information:					
4	Fee Worksheet (PTO-06)	fee-info.pdf	8200	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			8406269		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

Acknowledgement Receipt

The USPTO has received your submission at **13:12:22** Eastern Time on **10-APR-2007** by Deposit Account: 160605.

\$ **180** fee paid by e-File via *RAM* with Confirmation Number: 1911.

You have also pre-authorized the following payments from your USPTO Deposit Account:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 and 1.17

eFiled Application Information

EFS ID	1668412
Application Number	09497383
Confirmation Number	7431
Title	System and method for scanning a document in client/server environment
First Named Inventor	David L. Bahr
Customer Number or Correspondence Address	826
Filed By	Jon Matthew Jurgovan/shelley victoria
Attorney Docket Number	7204
Filing Date	03-FEB-2000
Receipt Date	10-APR-2007
Application Type	Utility

Application Details

Submitted Files	Page Count	Document Description	File Size	Warnings
258663USIDS.pdf	4	Information Disclosure Statement (IDS) Filed	659294 bytes	◆ PASS
OfficeAction.PDF	4	NPL Documents	838413 bytes	◆ PASS
EP0867817.PDF	47	Foreign Reference	6900362 bytes	◆ PASS
fee-info.pdf	2	Fee Worksheet (PTO-06)	8200 bytes	◆ PASS

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	09497383
Filing Date	2000-02-03
First Named Inventor	Bahr
Art Unit	2143
Examiner Name	Neurauter, George C.
Attorney Docket Number	047307/258663

U.S. PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear
	1	5956487		1999-09-21	Venkatraman et al	

If you wish to add additional U.S. Patent citation information please click the Add button.

U.S. PATENT APPLICATION PUBLICATIONS

Examiner Initial*	Cite No	Publication Number	Kind Code ¹	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear
	1					

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FOREIGN PATENT DOCUMENTS

Examiner Initial*	Cite No	Foreign Document Number ³	Country Code ²	Kind Code ⁴	Publication Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear	T ⁵
	1	0867817	EP	A2	1999-09-30	Shima et al		<input type="checkbox"/>

If you wish to add additional Foreign Patent Document citation information please click the Add button

NON-PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ⁵

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	09497383
Filing Date	2000-02-03
First Named Inventor	Bahr
Art Unit	2143
Examiner Name	Neurauter, George C.
Attorney Docket Number	047307/258663

1	Art cited from attached Canadian Office Action dated October 16, 2006.	<input type="checkbox"/>
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If you wish to add additional non-patent literature document citation information please click the Add button

EXAMINER SIGNATURE

Examiner Signature		Date Considered	
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT****(Not for submission under 37 CFR 1.99)**

Application Number	09497383
Filing Date	2000-02-03
First Named Inventor	Bahr
Art Unit	2143
Examiner Name	Neurauter, George C.
Attorney Docket Number	047307/258663

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

- ☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

- ☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

- ☐ See attached certification statement.
- ☒ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.
- ☐ None

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Jon M. Jurgovan/	Date (YYYY-MM-DD)	2007-04-10
Name/Print	Jon M. Jurgovan	Registration Number	34833

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
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7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.



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K2P 0A2

RECEIVED OCT 18 2006

October 16, 2006

Application No. : 2,400,010
Owner : INTERTECH INFORMATION MANAGEMENT, INC.
Title : **SYSTEM AND METHOD FOR SCANNING A DOCUMENT IN
CLIENT/SERVER ENVIRONMENT**
Classification : H04N 1/00 (2006.01)
Your File No. : **7204-38549**
Examiner : Gilbert Jean

*YOU ARE HEREBY NOTIFIED OF A REQUISITION BY THE EXAMINER IN ACCORDANCE
WITH SUBSECTION 30(2) OF THE PATENT RULES. IN ORDER TO AVOID ABANDONMENT
UNDER PARAGRAPH 73(1)(A) OF THE PATENT ACT, A WRITTEN REPLY MUST BE
RECEIVED WITHIN SIX MONTHS AFTER THE ABOVE DATE.*

This application has been examined taking into account applicant's correspondence received in this office on October 12, 2005.

The number of claims in this application is 71.

A further search of the prior art has revealed the following:

References applied

European Patent Application

867,817 Sep. 30, 1998 G06F 17/30 *Shima et al.*

United States Patent

5,956,487 Sep. 21, 1999 G06F 13/14 *Venkatraman et al.*

Shima et al. disclose a scanner that provides a web browser section wherein an entered URL is converted into a setup value by the URL interpretation section. The setup values are set in a drive control section, whereby an image is read under a desired read condition.

Canada

OPIC  CIPPO

Venkatraman et al. disclose a web access functionality that is embedded in a device to enable enhanced user interface functions for the device. A web server in the device provides access to the user interface functions for the device through a device web page.

Obviousness

The subject of the present application relates to a method of transmission of data between client devices and servers coupled by one or more networks. The method can be used to transfer documents in electronic form between parties in mortgage lending transactions or in court proceedings, for example.

Shima et al. teach an image information input-output used to perform input-output processing of image information, such as a scanner, a printer, a copy machine, a facsimile machine, a digital still-video camera. The hypertext information retrieval environment allows the user to use the image information input-output unit without installing special driver software.

Venkatraman et al. teach a method of embedding web access functionality into a device that includes a web server that provides a device web page. The device includes an embedded network interface that enables access to the device web page by a web browser.

In the last correspondence, it was argued that the references applied do not disclose generating a display within a web browser from a HTML document in which the display includes a document display portion, an Index portion and a control portion wherein no specific additional software is required.

Claim 1 recites a method comprising the step of :

- generating a display based on a hypertext mark-up language (HTML) document stored in a client device using a web browser of a user interface of the client device.

Shima et al. disclose an image information input-output wherein a user accesses an information terminal that can issue retrieval information when using the hypertext information retrieval environment. Therefore, the user can access the image information input-output without installing special driver software (column 3, lines 55 to 58).

Venkatraman et al. disclose a method of embedding web access functionality into a device. A user of the web browser may access the user interface functions for the device through the device web page (column 2, lines 19 to 26).

- a document display portion including a display of document data received from a scanner coupled to the client device.

Shima et al. disclose an image information input-output unit of a scanner that comprises a display unit for displaying the result of reading the information retrieval environment (column 5, lines 49 to 58).

- a control portion for generating a start scan signal to initiate scanning of the document with the scanner to generate the document data.

Shima et al. disclose an image information input-output that comprises control information means for controlling the operation of the image processing means (column 3, lines 19 to 29).

Venkatraman et al. disclose a method of embedding web access functionality into a device wherein some of the user interface functions enable control functions of the device (column 8, lines 16 to 23).

Thus, claim 1 is obvious since it defines the technical features that are disclosed by *Shima et al.* and *Venkatraman et al.*, namely, generating a display based on a hypertext mark-up language (HTML) document stored in a client device using a web browser of a user interface of the client device, a document display portion including a display of document data received from a scanner coupled to the client device, and a control portion for generating a start scan signal to initiate scanning of the document with the scanner to generate the document data.

Claims 9, 26, 38, 47, 51 and 53, which are directed to the same subject matter as claim 1, are also found to be obvious.

Dependent claims 2 to 8, 10 to 25, 27 to 37, 39 to 46, 48 to 50, 52 and 54 to 71, which further define the subject matter of claims 1, 9, 26, 38, 47, 51 and 53, fail to introduce any inventive limitations and are also considered obvious.

Although *Venkatraman et al.* do not disclose a document display portion including a display of document data received from a scanner, *Shima et al.* disclose an image information input-output unit of a scanner that comprises a display unit for displaying the result of reading the information retrieval environment.

Therefore, claims 1 to 71 do not comply with section 28.3 of the *Patent Act*. The subject matter of these claims would have been obvious on the claim date to a person skilled in the art or science to which they pertain having regard to *Shima et al.* and *Venkatraman et al.*, in light of the common knowledge disclosed by *Shima et al.*

In view of the foregoing defects, the applicant is requisitioned, under subsection 30(2) of the *Patent Rules*, to amend the application in order to comply with the *Patent Act* and the *Patent Rules* or to provide arguments as to why the application does comply.

Under section 34 of the *Patent Rules*, any amendment made in response to this requisition must be accompanied by a statement explaining the nature thereof, and how it corrects each of the above identified defects.

Gilbert Jean
Patent Examiner
(819) 934-5148

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
 30.09.1998 Bulletin 1998/40

(51) Int Cl⁶: **G06F 17/30, H04N 1/21,
 G06T 17/00**

(21) Application number: **98302288.0**

(22) Date of filing: **25.03.1998**

(84) Designated Contracting States:
**AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC
 NL PT SE**
 Designated Extension States:
AL LT LV MK RO SI

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Shinjuku-ku, Tokyo (JP)

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Suwa-shi, Nagano-ken (JP)

(30) Priority: **25.03.1997 JP 72214/97**
23.01.1998 JP 11407/98

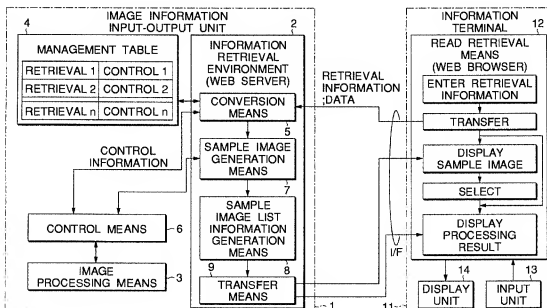
(74) Representative: **Sturt, Clifford Mark et al**
Miller Sturt Kenyon,
9 John Street
London WC1N 2ES (GB)

(54) **Image information input-output unit, image information input-output unit control method, and image information processing system**

(57) A web browser section provided in a scanner comprises a management table for relating URLs and setup values to each other and managing them and a URL interpretation section. A URL entered from a web

browser installed in an information terminal is converted into a setup value by the URL interpretation section. The setup value is set in a drive control section through a setting section, whereby an image is read under a desired read condition.

FIG.1



Description

BACKGROUND OF INVENTION

This invention relates to an image information input-output unit for performing input-output processing of image information, such as a scanner, a printer, a copy machine, a facsimile machine, a digital still-video camera, or a digital video camera, an image information input-output unit control method, and an image information processing system.

For example, a scanner for reading an image on a paper medium, a printer for printing on a print recording medium based on input print data, or the like is known as an image information input-output unit. The user can obtain desired image data, for example, by transferring image data between an information terminal such as a personal computer and an image information input-output unit.

That is, with a scanner, image data read through the scanner and converted into digital data by the scanner can be used in application programs of a database, document preparation (word processing) software, etc. With a printer, print data prepared by an application program of document preparation (word processing) software, etc., is input to the printer, whereby any desired print result can be obtained.

To conventionally use an image information input-output unit, driver software to use the image information input-output unit needs to be previously installed in an information terminal. That is, for example, with the scanner, the information terminal needs to be provided with a program to read image data into the information terminal. With the printer, the information terminal needs to have a program to transfer print data to the printer.

By the way, the driver software required to use image information input-output units vary from one image information input-output unit to another. That is, the driver software used for the scanner differs from that used to the printer. The driver software for one scanner and that for another similar scanner vary depending on the scanner manufacturer, model, etc.

Therefore, the user must previously install proper driver software in the information terminal in response to his or her image information input-output unit. However, it is intricate and low in operating ease to install driver software, etc. For example, to properly use both a color ink jet printer and a monochrome laser printer in response to print, the driver software must also be changed, leading to low operability and ease of use. Particularly, in recent years, image information input-output units have been often shared through various networks such as a LAN (local area network) and an intranet. To share an image information input-output unit among a number of information terminals connected by a network, the driver software must be installed in response to the shared image information input-output unit.

It is therefore an object of the invention to provide an image information input-output unit, an image information input-output unit control method, and an image information processing system that can produce desired image information input-output processing results by separating control information for executing image processing and information entered from an information terminal (retrieval information, command information, or resource request information) for eliminating the need for machine (device)-dependent driver software and enabling seamless operation. It is another object of the invention to provide an image information input-output unit, an image information input-output unit control method, and an image information processing system that can be controlled by storing control information required for performing image information input-output processing in the image information input-output unit and indirectly specifying the control information by entering information from an information terminal. It is still another object of the invention to provide an image information input-output unit, an image information input-output unit control method, and an image information processing system that can perform various types of image information processing seamlessly under a unified operation environment without using special driver software by using a hypertext information retrieval environment (or a web server function) and read retrieval means (or a web browser) that can execute two-way communication with the information retrieval environment.

SUMMARY OF INVENTION

To the ends, control information required for causing image processing means to perform predetermined image information processing is not issued from an information terminal and is specified indirectly by entering retrieval information or command information from the information terminal, thereby causing an image information input-output unit according to the invention to perform desired image information input-output processing. The invention will be discussed with reference to Fig. 1, schematic representation of problem solution means.

According to the first aspect of the invention, there is provided an image information input-output unit 1 comprising a hypertext information retrieval environment 2 for driving image processing means 3 based on control information, thereby performing input-output processing of image information, characterized by a management table 4 for managing retrieval information and the control information in correspondence with each other, conversion means 5 for looking up in the management table 4 based on the entered retrieval information and converting the retrieval information into predetermined control information, and control means 6 for controlling the operation of the image processing means 3 based on the control information into-which the retrieval

information is converted by the conversion means 5.

The "image information input-output unit 1" is a concept including image information input units, image information output units, and image information input-output units. The image information input units include a scanner, a film scanner, a digital still-video camera, a digital video camera, etc., for example. The image information output units include a printer, a plotter, a display, etc., for example. The image information input-output units include a facsimile machine, for example. The "hypertext information retrieval environment 2" means an environment to enable the user to retrieve and read a hypertext comprising information resources related to each other; specifically, it corresponds to a WWW (World Wide Web) server function, for example. The "image processing means 3" means for inputting, outputting, or inputting-outputting image information; specifically, it corresponds to a print engine, an image data read section, etc., for example. The "control information" means information required for controlling the operation of the image processing means 3; specifically, it contains setup values of color or monochrome specification, read resolution specification, etc., for example. Control code, etc., other than the setup values may be included. The "retrieval information" is information required for retrieving information resources under the hypertext information retrieval environment 2; specifically, it corresponds to a URL (Uniform Resource Locator), etc., for example.

When retrieval information is entered from the outside of the image information input-output unit 1, the conversion means 5 looks up in the management table 4 and converts the retrieval information into predetermined control information. If the entered retrieval information does not correspond to control information, it is processed as normal retrieval information. For example, when a URL of "http://xxx/action/300dpi" is entered, if "action/300dpi" is previously related to the control information meaning "read image at read resolution 300 dpi" in the management table 4, the URL is converted into control information by the conversion means 5, whereby the image read operation at 300 dpi is executed. On the other hand, for example, when a URL of "http://xxx/status.html" is entered, if "status.html" is not registered in the management table 4, the URL is handled as normal retrieval information. If a document file named "status.html" exists in the information retrieval environment 2, the document file is called. The "xxx" in the URL stands for the IP address assigned to the image information input-output unit or the name of a machine containing a web server.

Retrieval information is used to indirectly specify control information, whereby predetermined image information input-output processing is performed. Thus, if the user uses an information terminal that can issue retrieval information for using the hypertext information retrieval environment 2, he or she can use the image information input-output unit without installing special

driver software. Since control information is specified by entering retrieval information, the operation environment need not be changed, so that various types of image information processing can be performed seamlessly.

According to the second aspect of the invention, the management table 4 relates a sample image generation request to predetermined retrieval information for managing them, and the information retrieval environment 2 comprises sample image generation means 7 for generating prediction results of image information input-output processing based on a plurality of preset control information pieces as sample images if the sample image generation request occurs as the predetermined retrieval information is entered, sample image list information generation means 8 for generating sample image list information for relating the retrieval information pieces corresponding to the sample images to the sample images and listing the same, and transfer means 9 for transferring the sample image list information to the retrieval-information entry source.

The "sample image" means an image generated by predicting the input-output result of actually performed image information processing. The processing result is checked by seeing the sample image before actual image information input-output processing is performed under the conditions set according to the control information. The sample image corresponds to a small image (thumbnail image) provided by thinning out image information provided by performing actual image information processing.

Retrieval information pieces are related to the sample images provided according to control information pieces and they are transferred, whereby the user at the retrieval information entry source (information terminal) can compare the sample images and select any desired processing result. Since the retrieval information pieces corresponding to the image information processing items are related to the sample images, the user can specify the related retrieval information piece for obtaining desired image information input-output processing result.

According to the third aspect of the invention, there is provided a control method for controlling an image information input-output unit 1 comprising a hypertext information retrieval environment 2 and a management table 4 for managing retrieval information and control information in correspondence with each other for driving image processing means 3 based on the control information, thereby performing input-output processing of image information, the control method comprising the steps of receiving the retrieval information, looking up in the management table 4 based on the received retrieval information and converting the retrieval information into predetermined control information, controlling the operation of the image processing means 3 based on the control information into which the retrieval information is converted, and transferring image information

provided by the image processing means 3 to the entry source of the retrieval information.

Thus, the function similar to that of the first aspect of the invention can be provided.

According to the fourth aspect of the invention, the control method further comprises the steps of relating a sample image generation request to predetermined retrieval information for managing them in the management table 4, determining whether or not the sample image generation request is received, generating the prediction results of image information input-output processing based on a plurality of preset control information pieces as sample images if the sample image generation request is received, generating sample image list information for relating the retrieval information pieces corresponding to the sample images to the sample images and listing the same, and transferring the sample image list information to the retrieval information entry source.

Thus, the function similar to that of the second aspect of the invention can be provided.

According to the fifth aspect of the invention, the control method further comprises the step of receiving data to be processed by the image processing means 3.

The "data to be processed by the image processing means 3" means data undergoing input-output processing as image information of bit image data, etc., given to a print engine, for example. "Data reception means for receiving data to be processed by the image processing means 3" can also be added.

According to the sixth aspect of the invention, there is provided an image information processing system comprising an image information input-output unit 1 having a hypertext information retrieval environment 2 and an information terminal 11 having read retrieval means 12 for reading and retrieving the information retrieval environment 2, characterized in that the image information input-output unit 1 comprises a management table 4 for managing retrieval information and the control information in correspondence with each other, conversion means 5 for looking up in the management table 4 based on the retrieval information entered through the read retrieval means 12 and converting the retrieval information into predetermined control information, and control means 6 for controlling the operation of image processing means 3 based on the control information into which the retrieval information is converted by the conversion means 5.

The "information terminal 11" means a personal computer, a portable information terminal, etc., for example. In addition, it may be mounted temporarily on the image information input-output unit 1 as a control panel thereof. Preferably, the information terminal 11 comprises an input unit 13 for entering retrieval information, etc., and a display unit 14 for displaying the result of reading the information retrieval environment 2, etc. The input unit 13 includes a keyboard, a pointing device such as a mouse, a tablet, a plasma display, etc., for example.

The display unit 14 includes a CRT, a liquid crystal display, a plasma display, etc., for example. The "read retrieval means 12" is means for using the hypertext information retrieval environment 2; for example, it corresponds to a web browser, etc.

The user can use the read retrieval means 12 to use the hypertext information retrieval environment 2 installed in the image information input-output unit 1 or any other unit and can enter predetermined retrieval information previously registered in the management table 4, thereby instructing the image information processing system to perform desired image information processing of print output, image read, etc. The user uses retrieval information to specify control information and thus can simply enter predetermined retrieval information registered in various units for performing various types of image information processing. For example, if the information terminal 11 is connected to printers and scanners by a network such as a LAN, the user needs only to enter retrieval information through the read retrieval means 12, whereby print output on the printer, image read through the scanner, and the like can be performed smoothly. That is, single operation means of the read retrieval means 12 enables the user to use various image information input-output units 1.

According to the seventh aspect of the invention, the management table 4 relates a sample image generation request to predetermined retrieval information for managing them, and the information retrieval environment 2 comprises sample image generation means 7 for generating the prediction results of image information input-output processing based on a plurality of preset control information pieces as sample images if the sample image generation request occurs as the predetermined retrieval information is received from the read retrieval means 12, sample image list information generation means 8 for generating sample image list information for relating the retrieval information pieces corresponding to the sample images to the sample images and listing the same, and transfer means 9 for transferring the sample image list information to the read retrieval means.

Thus, the user can compare the sample images through the read retrieval means 12 and select any desired sample image. Retrieval information pieces corresponding to control information pieces for performing the image information processing items related to the sample images are related to the sample images in a one-to-one correspondence with each other. Therefore, the user can enter predetermined retrieval information in the image information input-output unit 1 simply by selecting a desired sample image for obtaining desired image information processing result.

The invention can also be understood as follows: It will be discussed with reference to Fig. 2, a schematic representation of problem solution means.

According to the eighth aspect of the invention, there is provided an image information input-output unit

21 for driving image processing means 22 based on control information, thereby performing input-output processing of image information, the image information input-output unit 21 comprising a management table 23 for managing control information and command information related to processing items that can be processed by the image processing means 22 in correspondence with each other, reception means 24 for receiving a request for transferring a processing list information indicating the processing items processed by the image processing means 22, processing list information generation means 25 for relating command information pieces to the processing list information pieces and returning the information pieces to the processing list information transfer requester if the processing list information transfer request is received, conversion means 26 for converting the command information into predetermined control information based on the management table 23 if the command information is entered based on the processing list information, and control means 27 for causing the image processing means 22 to perform the processing item based on the predetermined control information into which the command information is converted.

Preferably, a hypertext information retrieval environment 2 is provided, but the invention is not limited to it. That is, the image information input-output unit 21 and the information terminal 31 may be connected by a communication protocol enabling two-way communication, whereby control information in the image information input-output unit 21 can be specified indirectly through command information. The "command information" means information to specify control information and is not limited to retrieval information as in the first aspect of the invention.

According to the ninth aspect of the invention, the processing list information is information listing the prediction results of image processing performed by the image processing means 22 as sample images.

Thus, the function similar to that of the second aspect of the invention can be provided.

According to the tenth aspect of the invention, there is provided an image information processing system comprising an image information input-output unit 21 for driving image processing means 22 based on control information, thereby performing input-output processing of image information and an information terminal 31 for entering information in the image information input-output unit 21, thereby causing the image information input-output unit 21 to perform desired image processing, characterized in that the image information input-output unit 21 comprises a management table 23 for managing control information and command information related to processing items that can be processed by the image processing means 22 in correspondence with each other, reception means 24 for receiving a request for transferring a processing list information indicating the processing items processed by the image processing

means 22 from the information terminal 31, processing list information generation means 25 for relating command information pieces to the processing list information pieces and returning the information pieces to the information terminal 31 if the processing list information transfer request is received, conversion means 26 for converting the command information into predetermined control information based on the management table 23 if the command information is entered from the information terminal 31 based on the processing list information, and control means 27 for causing the image processing means 22 to perform the processing item based on the predetermined control information into which the command information is converted, and that the information terminal 31 comprises processing list information transfer request generation means 32 for generating the processing list information transfer request, selection means 33 for selecting a desired processing item based on the processing list information returned from the processing list information generation means, and selection information input means 34 for entering the command information related to the selected processing item in the image information input-output unit 21.

Thus, the user can check a list of the processing items that can be executed by the image information input-output unit 21. Since command information pieces are related to the processing list information items, the user can simply select a desired processing item, thereby entering the command information related to the processing item in the image information input-output unit 21. The command information entered from the information terminal is converted into predetermined control information by the conversion means 26 and the control information is input to the control means 27.

According to the eleventh aspect of the invention, the processing list information is information listing the prediction results of image processing performed by the image processing means 22 as sample images.

Thus, the effects similar to those of the second aspect of the invention can be produced.

According to the twelfth aspect of the invention, the information terminal 31 further includes storage means 35 for saving the selected command information.

Once selected command information is saved on the storage means 35, whereby a similar processing item can be obtained promptly at the next image information processing time.

According to the thirteenth aspect of the invention, there is provided a program recording medium for recording a program for driving image processing means based on control information, thereby performing input-output processing of image information, the program recording medium for recording the program for causing a computer to provide a function of generating a hypertext information retrieval environment, a management function of managing retrieval information for using the information retrieval environment and the control infor-

mation in correspondence with each other, and a conversion function of converting entered retrieval information into predetermined control information in a format that can be read and understood by the computer.

For example, floppy disk, hard disk, compact disk, magneto-optic disk, magnetic tape, memory, or any other type of recording medium can be adopted as the "recording medium." In addition to the physical recording media, a communication medium for remotely downloading the program over a communication line can also be used, for example.

The program is read into the microcomputer system of the image information input-output unit, thereby providing a unit comprising the hypertext information retrieval environment, the management function, and the conversion function. Therefore, the function similar to that of the first aspect of the invention can be provided.

According to the fourteenth aspect of the invention, the management function relates a sample image generation request to predetermined retrieval information for managing them, and the program can cause the computer to further provide a sample image generation function of generating prediction results of image information input-output processing based on a plurality of preset control information pieces as sample images if the sample image generation request occurs as the predetermined retrieval information is entered, a sample image list information generation function of generating sample image list information for relating the retrieval information pieces corresponding to the sample images to the sample images and listing the same, and a transfer function of transferring the sample image list information to the retrieval information entry source.

Thus, the function similar to that of the second aspect of the invention can be provided.

According to the fifteenth aspect of the invention, there is provided a program recording medium for recording a program for driving image processing means based on control information, thereby performing input-output processing of image information, the program recording medium for recording the program for causing a computer to provide a management function of managing control information and command information related to processing items that can be processed by the image processing means in correspondence with each other, a reception function of receiving a request for transferring a processing list information indicating the processing items processed by the image processing means, a processing list information generation function of relating command information pieces to the processing list information pieces and returning the information pieces to the processing list information transfer requester if the processing list information transfer request is received, and a conversion function of converting the command information into predetermined control information based on the management table if the command information is entered based on the processing list information in a format that can be read and understood

by the computer.

The program is built in a microcomputer system, whereby the function similar to that of the eighth aspect of the invention can be provided.

According to the sixteenth aspect of the invention, the processing list information can be information listing the prediction results of image processing performed by the image processing means as sample images.

Thus, the function similar to that of the ninth aspect of the invention can be provided.

According to the seventeenth aspect of the invention, there is provided an image information input-output unit comprising a web page function for driving image processing means based on control information, thereby performing input-output processing of image information, characterized by web page generation means for generating a web page having resource request information related to processing items that can be processed by the image processing means, management table for managing the resource request information and the control information in correspondence with each other, conversion means for converting the resource request information selected through the web page into predetermined control information based on the management table, and control means for controlling the operation of the image processing means based on the control information into which the resource request information is converted.

The "resource request information" is information for requesting the web server to transmit an information resource and specifically refers to URL. The "web page" means a file in an HTML (HyperText Markup Language) format.

For example, the web page generation means relate resource request information pieces to the processing items in a one-to-one correspondence with each other and generates a web page. If the user who reads the web page through the web browser selects a desired processing item, the resource request information piece related to the processing item is entered in the image information input-output unit. The conversion means converts the entered resource request information piece into control information and passes the control information to the control means, whereby the control information can be specified indirectly according to the resource request information as in the first aspect of the invention.

According to the eighteenth aspect of the invention, the resource request information can contain history information of the selected processing item.

The "history information" means information indicating a selection history of the processing items selected in the past in a selection operation sequence. For example, when resolution is already selected by the preceding selection operation, the resource request information related to the web page contains the selected resolution information. For example, assume that a resolution selection button and a halftone processing selection button are displayed on the web page and that

resolution is first selected, then halftone processing is selected. When only resolution is selected at the beginning, resource request information of "http://xxx/resolution selection/" is generated. When halftone processing is next selected, new resource request information containing the previously selected resolution information (history information) is generated like "http://xxx/resolution selection/halftone processing selection/". Thus, whenever a processing item executed by the image processing means is selected, new resource request information containing the previously selected processing item history information is generated, whereby the last entered resource request information can be converted into control information by the conversion means in batch.

For example, as in the nineteenth aspect of the invention, the web page generation means can analyze received resource request information, detect the history information, and relate the resource request information containing the history information to the processing item, thereby generating the web page.

That is, the web page generation means analyzes the structure of entered resource request information, detects the history information, generates new resource request information containing the history information, and relates the resource request information to the processing item on the web page. In the above-given example, when the resolution is selected, new resource request information containing the already selected resolution information is related to each halftone processing selection button like "http://xxx/resolution selection/dither processing/" or "http://xxx/resolution selection/error diffusion method/". In other words, the web page generation means updates the resource request information so as to contain processing item history information, whereby entered resource request information can hold all history information selected in the past.

According to the twentieth aspect of the invention, the web page can list the processing patterns that can be processed by the image processing means and the resource request information pieces for realizing the processing patterns can be related to the processing patterns in a one-to-one correspondence with each other.

That is, the web page lists selectable processing patterns such as "600 dpi + dither processing" (http://xxx/600/dither/), "600 dpi + error diffusion method" (http://xxx/600/error diffusion/), "300 dpi + dither processing" (http://xxx/300/dither/), and "300 dpi + error diffusion method" (http://xxx/300/error diffusion/), and the resource request information pieces for realizing the processing patterns are related to the processing patterns in a one-to-one correspondence with each other. Therefore, the user needs only to select a desired processing pattern; operability is improved.

According to the twenty-first aspect of the invention, there is provided a control method for controlling an image information input-output unit comprising a web page

function and management table for managing the resource request information and the control information in correspondence with each other for driving image processing means based on the control information, thereby performing input-output processing of image information, the control method comprising a first step of generating a web page having resource request information related to processing items that can be processed by the image processing means, a second step of receiving resource request information specified through the web page, a third step of converting the received resource request information into predetermined control information based on the management table, a fourth step of controlling operation of the image processing means based on the control information into which the resource request information is converted, and a fifth step of preparing a web page containing image information provided by the image processing means and transferring the web page to the resource request information entry source.

Thus, the function similar to that of the seventeenth aspect of the invention can be provided.

According to the twenty-second aspect of the invention, the resource request information can contain history information of the selected processing item.

Thus, the function similar to that of the eighteenth aspect of the invention can be provided.

According to the twenty-third aspect of the invention, the first step web can analyze received resource request information, detect the history information, and relate the resource request information containing the history information to the processing item, thereby generating the web page.

Thus, the function similar to that of the nineteenth aspect of the invention can be provided.

According to the twenty-fourth aspect of the invention, the web page can list the processing patterns that can be processed by the image processing means and the resource request information pieces for realizing the processing patterns can be related to the processing patterns.

Thus, the function similar to that of the twenty of the invention can be provided.

According to the twenty-fifth aspect of the invention, there is provided an image information processing system comprising an image information input-output unit having a web server function and an information terminal having a web browser for using the web server function, characterized in that the image information input-output unit comprises image processing means driven based on control information, web page generation means for generating a web page having resource request information related to processing items that can be processed by the image processing means and transmitting the web page to the information terminal, a management table for managing the resource request information and the control information in correspondence with each other, conversion means for converting

the resource request information selected through the web page according to the web browser into predetermined control information based on the management table, and control means for controlling the operation of the image processing means based on the control information into which the resource request information is converted.

Thus, the image information input-output unit can be operated according to the web browser contained in the information terminal without installing peculiar driver software and the function similar to that of the seventeenth aspect of the invention can be provided.

According to the twenty-sixth aspect of the invention, the resource request information can contain history information of the selected processing item.

Thus, the function similar to that of the eighteenth aspect of the invention can be provided.

According to the twenty-seventh aspect of the invention, the web page generation means can analyze received resource request information, detect the history information, and relate the resource request information containing the history information to the processing item, thereby generating the web page.

Thus, the function similar to that of the nineteenth aspect of the invention can be provided.

According to the twenty-eighth aspect of the invention, the web page can list the processing patterns that can be processed by the image processing means and the resource request information pieces for realizing the processing patterns can be related to the processing patterns.

Thus, the function similar to that of the twentieth aspect of the invention can be provided.

According to the twenty-ninth aspect of the invention, there is provided a program recording medium for recording a program for driving image processing means based on control information, thereby performing input-output processing of image information, the program recording medium for recording the program for causing a computer to provide a web server function of providing a web page in response to resource request information, a web page generation function of generating a web page having resource request information related to processing items that can be processed by the image processing means, management table for managing the resource request information and the control information in correspondence with each other, and conversion means for converting the resource request information selected through the web page into predetermined control information based on the management function in a format that can be read and understood by the computer.

Thus, the function similar to that of the seventeenth aspect of the invention can be provided.

According to the thirtieth aspect of the invention, the resource request information can contain history information of the selected processing item.

Thus, the function similar to that of the eighteenth

aspect of the invention can be provided.

According to the thirty-first aspect of the invention, the web page generation function analyzes received resource request information, detects the history information, and relates the resource request information containing the history information to the processing item, thereby generating the web page.

Thus, the function similar to that of the nineteenth aspect of the invention can be provided.

According to the thirty-second aspect of the invention, the web page lists the processing patterns that can be processed by the image processing means and the resource request information pieces for realizing the processing patterns are related to the processing patterns.

Thus, the function similar to that of the twentieth aspect of the invention can be provided.

BRIEF DESCRIPTION OF THE DRAWINGS

In the accompanying drawings:

Fig. 1 is a functional block diagram to explain a functional configuration of the invention;

Fig. 2 is a functional block diagram to explain another functional configuration of the invention;

Fig. 3 is a block diagram of an image information processing system according to a first embodiment of the invention applied to a scanner;

Fig. 4 is a schematic representation to show the format of a management table, etc.,;

Fig. 5 is a flowchart to show information terminal processing;

Fig. 6 is a flowchart to show scanner processing;

Fig. 7 is a schematic representation of a screen listing thumbnail images of scan prediction images;

Fig. 8 is a schematic representation of a screen displaying an image provided according to a desired setup value;

Fig. 9 is a block diagram of an image information processing system according to a second embodiment of the invention applied to a printer;

Fig. 10 is a flowchart to show information terminal processing;

Fig. 11 is a flowchart to show printer processing;

Fig. 12 is a schematic representation of a screen listing thumbnail images of print samples;

Fig. 13 is a block diagram of an image information processing system according to a third embodiment of the invention applied to a scanner;

Fig. 14 is a schematic representation to show a screen of a URL input environment constructed in a web browser by a manipulation program;

Fig. 15 is a block diagram of an image information processing system according to a fourth embodiment of the invention applied to a scanner;

Fig. 16 is a schematic representation to show the format of a management table, etc.,;

Fig. 17 is a flowchart to show scanner processing; Fig. 18 is a schematic representation to show transmission of web pages and URLs, etc.,;

Fig. 19 is a schematic representation to show transmission of web pages and URLs, etc., in an image information processing system according to a fifth embodiment of the invention;

Fig. 20 is a block diagram to show an image information processing system according to a sixth embodiment of the invention;

Fig. 21 is a schematic representation to show schematically a communication state among an information terminal, a management server, and a scanner; Fig. 22 is a schematic representation to show a hierarchical structure of web pages;

Fig. 23 is a flowchart to show scanner processing in an image information processing system according to a seventh embodiment of the invention;

Fig. 24 is a flowchart to show scanner processing in an image information processing system according to an eighth embodiment of the invention; and

Fig. 25 is a flowchart to show URL monitor processing in an image information processing system according to a ninth embodiment of the invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Referring now to the accompanying drawings, there are shown preferred embodiments of the invention.

1. First embodiment

Figs. 3-8 relate to a first embodiment of the invention. Fig. 3 is a block diagram to show the configuration of an image information processing system according to the embodiment.

1-1 Functional configuration of scanner

A scanner 41 as an "image information input-output unit" according to the first embodiment comprises a network connection section 42, an image data read section 43, a drive control section 44, a setting section 45, and a web server section 46, as described later.

The network connection section 42 is provided for two-way communication with an information terminal 61 (described later) over a communication line 100; specifically, it comprises protocols such as TCP/IP (Transmission Control Protocol/Internet Protocol) and HTTP (Hypertext Transfer Protocol), for example.

The image data read section 43 comprises an optical system consisting of an image pick-up device such as a line CCD and a light source and an optical system drive mechanism for scanning the optical system, for example. While light incident on a read object of an original, etc., from the light source and reflected from the read object is photoelectrically converted by the image

pick-up device, the optical system is scanned, whereby image data can be read.

The drive control section 44 controls drive of the image data read section 43 and the drive control section 44 and the image data read section 43 make up "image processing means." The drive control section 44 comprises a drive mechanism control section for controlling the optical system drive mechanism and a signal processing section for processing output signals from the image pick-up device, for example.

The setting section 45 is provided for inputting various setup values as "control information" into the drive control section 44 and forms "control means." More particularly, the setting section 45 is used to input various setup values of read resolution, halftone processing algorithm, etc., into the drive control section 44 for reading image data in a predetermined mode.

The web server section 46 provides a WWW (World Wide Web) function and corresponds to a "hypertext information retrieval environment." It has a function of transferring an HTML format file specified with URL (Uniform Resource Locator) from the information terminal 61 according to the HTTP.

The web server section 46 comprises an HTTP request reception section 47 for receiving an HTTP request such as URL entered from the information terminal 61, an HTTP response preparation section 48 for generating an HTTP response returned to the information terminal 61 in response to the HTTP request, a URL interpretation section 49, a management table 50, and a format preparation section 51.

The URL interpretation section 49 as "conversion means" interprets the URL input through the HTTP request reception section 47 by looking up the URL in the management table 50. As shown in Fig. 4, the management table 50 stores predetermined setup values in a one-to-one correspondence with URL entries for each URL type. Specifically, for example, setup values are stored in a one-to-one correspondence with items of read resolution, halftone processing algorithm, etc. Setup values to generate "sample image list information" or "processing content list information" are related to the IP address assigned to the scanner 41. Therefore, for example, if an URL of "http://xxx/B600.html" is input, the URL interpretation section 49 looks up in the management table 50 based on the URL, thereby converting the URL into setup values to realize a process of "reading image data at read resolution 600 dpi processed by error diffusion method."

The format preparation section 51 converts image data read by the image data read section 43 into an image file in a format that can be read with a web browser, such as JPEG (Joint Photographic Experts Group) or GIF (Graphics Interchange Format). The image file in a predetermined format is embedded in an HTML format file by the HTTP response preparation section 48.

1-2 Functional configuration of information terminal 61

For example, the information terminal 61 such as a personal computer or a portable information terminal is a WWW client using the web server section 46. It comprises a network connection section 62, a web browser 63, an input unit 64, and a display unit 65.

Like the network connection section 42 of the scanner 41, the network connection section 62 comprises protocols such as TCP/IP and HTTP.

The web browser as "read retrieval means" is provided for reading or retrieving HTML format files in the web server section 46. For example, an HTML format file is specified with an URL as "retrieval information" or "command information," such as "http://server name/directory name/file name/" whereby the file can be read. A predetermined URL, namely, a URL previously entered in the management table 50 is input to the web server section 46 by the web browser 63, whereby image data can be read under a desired setting condition.

The input unit 64 is used to enter a URL, etc.; for example, a keyboard, a pointing device, or the like can be used. The display unit 65 displays the read contents, etc.; for example, a CRT, a liquid crystal display, or the like can be used.

1-3 Operation

Next, the operation of the embodiment will be discussed with reference to Figs. 5-8. Fig. 5 is a flowchart to show read retrieval processing executed by the web browser 63. A sample image transfer request, etc., can be made in response to a URL input to the read retrieval means 63.

When a URL is input at step S1, an HTTP request generated as the event occurs is transferred to the scanner 41 through the network connection section 62 at step S2. A wait is made for receiving an HTML format file returned from the scanner 41 in response to the HTTP request at step S3.

If the HTML format file is returned from the scanner 41, it is displayed on the display unit 65 at step S4. Next, a tag as link information embedded in the HTML format file is detected at step S5 and an HTTP request for transferring an image file such as JPEG linked by the tag is transferred to the scanner 41 at step S6. This image file transfer request can be made by using a GET command, etc. At step S7, when the image file is returned from the scanner 41 in response to the HTTP request issued at step S6, it is displayed on the display unit 65 at step S8. The steps S5-S8 are repeated until all image files embedded in the HTML format file received at step S3 are received at step S9. Upon reception of all image files, the processing is terminated.

It should be noted that the specific processing contents at steps S1-S9 vary depending on the URL input at step S1. In other word, the flowchart shown in Fig. 5 can be used in various forms simply by changing the

input URL.

(1) To make a request for displaying a thumbnail image

A thumbnail image as a "sample image" is small image data provided by thinning out image data to be originally obtained. In the embodiment, the thumbnail image indicates the prediction result (prescan) before formal image read is executed. As shown in Fig. 7 described later, in the embodiment, various image read modes that can be provided by the scanner 41 are shown on the information terminal 61 according to an HTML format file in which a number of thumbnail images are embedded.

A URL to make a request for listing thumbnail images is specified as the IP address of the scanner 41, for example. That is, if the URL input at step S1 is "http://IP address/" not followed by a directory name, file name, etc., the URL interpretation section 49 interprets the URL as a "request for preparing a thumbnail image list."

When an HTML format file as a menu screen for displaying thumbnail images is returned from the scanner 41 at steps S3 and S4, an image file transfer request of each thumbnail image embedded in the HTML format file is transferred and returned images are displayed together with HTML at steps S5-S9.

(2) To give an image read instruction

To send an image read instruction from the information terminal 61 to the scanner 41, various setup values of read resolution, halftone processing algorithm, etc., are specified indirectly through a URL. For example, if a URL of a structure like "http://IP address/algorithm selection/resolution selection/" is input at step S1, the URL interpretation section 49 converts the input URL into various setup values required for image read processing. When image read is executed in the specified image read mode, an HTML format file indicating the scan result is returned from the scanner 41 at steps S3 and S4 and the image files embedded in the HTML format file are displayed at steps S5-S9.

(3) To give an operation instruction to another image information input-output unit

If another image information input-output unit is connected over the communication line 100 and has a web server section serving a similar function to that in the embodiment, a predetermined URL entered in the web server section is input at step S1, whereby the image information input-output unit can be operated.

(4) To use as a normal web browser

For example, to access a WWW server on the Internet for reading a web page, etc., the URL of the de-

sired web page may be entered at step S1, whereby two-way communication with the WWW server is executed.

Next, processing of the scanner 41 will be discussed with reference to a flowchart shown in Fig. 6.

First, when an entered HTTP request is received from the information terminal 61 at step S11, the URL in the HTTP request is extracted at step S12. The URL interpretation section 49 looks up in the management table 50 based on the extracted URL and converts an element of the URL into the corresponding setup value at step S13, and inputs the setup value into the setting section 45, which then sets the setup value in the drive control section 44 at step S14. The steps S13 and S14 are repeated until all elements of the URL received at step S11 are converted at step S15.

Next, whether or not a prescan execution instruction is given for generating thumbnail images is determined at step S16. If the URL received at step S11 contains only the IP address of the scanner 41, it is determined that a prescan execution request is made, as described above. However, the invention is not limited to it as is obvious to those skilled in the art. For example, prescan can also be executed by entering a URL of a structure of "http://IP address/prescan."

Since which of prescan and original scan the URL specifies can be determined uniquely as a result of the URL interpretation, there is a possibility that the decision block at step S16 will not appear on the program. The step S16 is shown for understanding the invention.

If the URL received at step S11 specifies the setup value of prescan execution, prescan is executed at step S17. Specifically, an image of an original, etc., is read rapidly so as to provide a thinned-out image at 72*72 dpi. The format preparation section 51 converts the read image into a predetermined image format that can be used with WWW of JPEG, GIF, etc., for example, at step S19. The HTTP response preparation section 48 embeds the image file in an HTML format file through a tag, thereby preparing an HTTP response at step S20. The HTML format file created as the HTTP response is transferred through the network connection section 42 to the information terminal 61 at step S21.

On the other hand, if the URL received at step S11 specifies the setup value related to formal scan execution, an image is read in accordance with the specified setup conditions at step S18. The read image is converted into an image file in a predetermined format at step S19. An HTML format file is created at step S20 and is transferred to the information terminal 61 at step S21.

The setup value specification method with a URL will be discussed with reference to Figs. 7 and 8. Fig. 7 shows a thumbnail image listing screen. As described above, the thumbnail image listing screen has nature as a menu screen to comprehensively show image read settings that can be executed by the scanner 41.

For example, a prediction image when image read

is executed at resolution 600 dpi processed by a dither method (A600.html) is shown in the upper left portion of Fig. 7; a prediction image when image read is executed at resolution 600 dpi processed by an error diffusion method is shown in the upper right portion of Fig. 7; a prediction image when image read is executed at resolution 300 dpi processed by the dither method is shown in the lower left portion of Fig. 7; and a prediction image when image read is executed at resolution 300 dpi processed by the error diffusion method is shown in the lower right portion of Fig. 7.

Therefore, the user can select the optimum image read condition (setup value) by comparing the thumbnail images on the screen and, for example, selecting the optimum thumbnail image with the pointing device, etc., or directly entering a desired URL through the keyboard, etc. When the user selects or enters the URL, the URL is transferred to the scanner 41 as an HTTP request and desired image read is executed. The read image is returned to the information terminal 61 as an HTML format file and is displayed on the screen as shown in Fig. 8.

If the user satisfies the displayed read image, he or she can save the selected URL. That is, the web browser 63 has a standard function of "bookmark save" for saving URLs. Therefore, the "bookmark save" can be used to easily save the URL used for the image read.

According to the embodiment thus configured, the following effects are produced:

First, the web server section 46 is installed in the scanner 41 and settings of the scanner 41 can be specified indirectly with a URL input through the web browser 63, so that labor of installing driver software dedicated to each unit as in the conventional art is saved and the scanner 41 can be operated seamlessly under the unified operation environment of the web browser 63.

Particularly, the normal information terminal 61 is provided with the web browser 63 as a substantially standard facility. Thus, the user need not get dedicated driver software for installation or learn a driver software operation method. Web pages can be collected smoothly and the scanner 41 can be operated smoothly.

Second, since dedicated driver software varying from one unit to another becomes unnecessary, the memory load and the CPU load of the information terminal can be decreased.

Third, thumbnail images to show prediction of the processing result can be listed on the screen before actual, formal image read is executed, so that desired image data can be gotten efficiently.

Fourthly, since the used URL can be saved, the selected image information input-output unit address and the used setup values can be saved in batch and the next image read can be executed promptly.

Fifthly, the optimum setup values selected for each purpose can be saved in the form of URL elements and when the unit is used next time, the setup values need not be selected again and the unit can be used in the same setting as the preceding time.

Sixthly, if more than one image information input-output unit comprising the web server function according to the invention exists on the network, only the unit address in a URL is changed, whereby the corresponding image information input-output unit can be used to perform processing in the same setting as the preceding time.

Seventhly, since the read retrieval means, a substantially standard facility of the information terminal, can be used to operate the image information input-output unit, the image information input-output unit can be operated immediately unlike the method of sending driver software to the information terminal as required.

2. Second embodiment

Next, a second embodiment of the invention will be discussed with reference to Figs. 9-12. Parts identical with those previously described with reference to Fig. 3 are denoted by the same reference numerals in Fig. 9 and will not be discussed again. The second embodiment is characterized by the fact that the invention is applied to a printer as an image information input-output unit.

2-1 Functional configuration of printer

A printer 71 according to the embodiment comprises a network connection section 72, a print engine 73, a drive section control section 74, an image preparation section 75, a setting section 76, and a web server section 77.

The network connection section 72 contains protocols such as TCP/IP and HTTP like the network connection section 42 described in the first embodiment. The print engine 73 is provided for printing on print recording media; for example, an ink jet engine, a laser engine, etc., can be adopted.

The drive section control section 74 controls the operation of the print engine 73. The image preparation section 75 prepares print image data given to the print engine 73. The print engine 73, the drive section control section 74, and the image preparation section 75 make up "image processing section."

The web server section 77 as a "hypertext information retrieval environment" provides a web server function for the printer 71 like the web server section 46 described in the first embodiment. It comprises an HTTP request reception section 78, an HTTP response preparation section 79, a URL interpretation section 80, and a management table 81.

As in the first embodiment, various setup values, such as print resolution, color specification, and halftone algorithm specification, are entered in the management table 81 as "control information" and predetermined URLs are previously related thereto. A URL input through the HTTP request reception section 78, etc., from an information terminal 61 is converted into prede-

termined setup values by the URL interpretation section 80 as "conversion means" and the setup values are input into the setting section 76. The setting section 76 as "control means" inputs the input setup values into the drive section control section 74, whereby printing is performed under the user-specified print conditions.

2-2 Operation

Next, the operation of the embodiment will be discussed with reference to Figs. 10-12. Fig. 10 is a flowchart to show processing of the information terminal 61.

Data to be printed is transferred from the information terminal 61 to the printer 71 at step S31. Specifically, a print file is opened in the web browser 63 and can be transferred to the printer 71 by using a HTTP PUT command, etc. Alternatively, for example, print data may be transferred by using any other means of FTP (File Transfer Protocol), LPR, etc. The LPR refers to a print queue management program called Berkeley line printer daemon service and becomes an Internet standard protocol as RFC (Request for Comments) 1179.

Next, an HTTP request is transferred to the printer 71 at step S32. The HTTP request transferred at step S32 is a request for transferring thumbnail images of the print image prediction results, namely, the print prediction results under various print conditions, such as printing of the previously transferred print file at step S31 at 720 dpi, at 360 dpi, in color, and in monochrome.

A wait is made for receiving an HTML format file for thumbnail images from the printer 71 at step S33. If the HTML format file is returned, it is displayed on a screen at step S34, a tag embedded in the HTML format file is detected at step S35, and a request for transferring the thumbnail image file linked by the tag is issued at step S36. This image file transfer request can be made by using a GET command, etc. When the thumbnail image is returned from the printer 71 to the information terminal 61 at step S37, it is displayed on the screen at step S38. The steps S35-S38 are repeated until all thumbnail images are received at step S39.

When the thumbnail images corresponding to various print settings are displayed as shown in Fig. 12, the user selects the thumbnail image corresponding to any desired print setting with a pointing device, etc., at step S40. When the URL provided in the selected thumbnail image is transferred from the information terminal 61 to the printer 71 at step S41, the printer 71 executes printing.

The steps S31 to S39 in the flowchart shown in Fig. 10 are basically the same as the steps S1 to S9 in the flowchart shown in Fig. 5 except that a print file is transferred at the beginning.

Next, Fig. 11 is a flowchart to show processing of the printer 71. First, when an HTTP request is received from the information terminal 61 at step S51, the URL is extracted at step S52. The URL interpretation section 80 converts an element of the URL into a predetermined

setup value at step S53 and the setting section 76 sets the setup value in the drive section control section 74 at step S54. The steps S53 and S54 are repeated until all elements of the URL are converted into setup values at step S55.

Whether or not the request is a preview request for listing thumbnail images is determined at step S56. If the request is a preview request, the image preparation section 75 prepares thumbnail images responsive to various print settings at step S57. Each thumbnail image is converted into image data in a predetermined format of JPEG, GIF, etc., at step S59. The HTTP response preparation section 79 prepares an HTTP response at step S60 and the HTTP response is transferred through the network connection section 72, etc., to the information terminal 61 at step S61.

The decision block at step S56 for determining whether or not the request is a preview request can be omitted. If a request for transferring a list of thumbnail images is made at step S52 in Fig. 10, control can be passed from step S51 in Fig. 11 to step S57 by skipping steps S52-S56.

On the other hand, if a request for print execution is indirectly made with URL, printing is executed based on the specified setup values at step S58.

The embodiment thus configured can also produce the effects similar to those of the first embodiment described above.

3. Third embodiment

Figs. 13 and 14 show a third embodiment of the invention. Parts identical with those previously described with reference to Fig. 3 are denoted by the same reference numerals in Fig. 13 and will not be discussed again. The third embodiment is characterized by the fact that a web server section 46 is provided with a simple input environment construction program of URLs.

A manipulation program 91 is installed in the web server section 46. The manipulation program 91 is prepared as an architecture-neutral program that can be executed with a web browser 63, such as a Java program (applet) developed by Sun Microsystems USA.

The manipulation program 91 is downloaded into an information terminal 61 from the web server section 46, whereby an operation environment, a URL input environment as shown in Fig. 14 can be provided. The user can easily enter even a URL not yet entered in Bookmark by handling the button corresponding to each setup value with a pointing device, etc.

4. Fourth embodiment

Next, a fourth embodiment of the invention will be discussed with reference to Figs. 15-18. Parts identical with those previously described with reference to Fig. 3 are denoted by the same reference numerals in Fig. 15 and will not be discussed again. The fourth embodiment

is characterized by the fact that a web page is provided by a web server function of an image information input-output unit and the processing contents are selected and verified through the web page.

4-1 Configuration

A scanner 111 as an image information input-output unit comprises a web server section 112, an interpretation section 115, a drive control section 44, and an image data read section 43. The web server section 112 includes a web page preparation section 114 as "web page preparation means" for preparing a predetermined web page in response to a URL as input "resource request information" and transmitting the web page to an information terminal 61.

A URL interpretation section 49 converts an input URL into a control command, etc., based on a management table 113. The control command is input to and interpreted by the interpretation section 115.

The management table 113 can be formed as shown in Fig. 16. For example, the IP address of the scanner 111 is related to a command for transmitting the preset top web page. As described later, if only the IP address is entered, a top menu page, such as INDEX.html, is transferred to the information terminal 61. In the management table 113, SCAN is related to a command indicating scan processing, 300 is related to read resolution 300 dpi, 600 is related to read resolution 600 dpi, Dither is related to dither processing, and Error is related to an error diffusion method for storage. Fig. 16 shows some of example control commands, etc., and the invention is not limited to them.

4-2 Operation

Next, the operation of the embodiment will be discussed with reference to Figs. 17 and 18. First, when an HTTP request is received from the information terminal 61 at step S71, a URL is extracted from the received request at step S72. Next, whether or not scan is to be executed is determined at step S73. For example, if the input URL contains a scan execution command or if all required for scan execution are selected, it can be determined that scan is to be executed.

If scan is not executed, NO is returned at step S73 and the structure of the input URL is analyzed and history information is extracted at step S74. A history of selecting various parameters of resolution, halftone processing method, etc., is detected as described later. A new URL is prepared so as to contain the detected history information at step S75 and is related to a web page at step S76. The web page thus prepared is transmitted to the information terminal 61 at steps S83 and S84.

On the other hand, if it is determined at step S73 that scan is to be executed, input URLs are converted into control commands in order starting at the top URL

at step S77 and the control commands are saved in a buffer at step S78. If all URLs are converted into the control commands at step S79, the control commands are passed to the interpretation section 115 at step S80 and scan is executed at step S81. The image provided as a result of the scan is prepared as an image file in a predetermined format at step S82 and is transmitted to the information terminal 61 as a part or all of the web page at step S83 and S84.

Fig. 18 shows schematically how the information terminal 61 and the scanner 111 communicate with each other.

First, a URL containing only the IP address of the scanner is sent from the information terminal 61 to the scanner 111. Since the URL containing only the IP address is related to an index page transmission request, the scanner 111 returns index page WP1 to the information terminal 61. The index page WP1 enables the user to choose a scanner processing screen or a help screen.

If the user selects scanner processing displayed as SCAN on the index page WP1, the URL corresponding to the selected SCAN (<http://xxx/SCAN/>) is transmitted to the scanner 111. When receiving the transfer request, the scanner 111 prepares the first page of scanner processing, WP2, and returns the page to the information terminal 61. The first page WP2 enables the user to choose read resolution between 600 dpi and 300 dpi.

It must be noted that the scanner 111 analyzes the structure of the received URL, extracts history information, prepares a new URL containing the history information, and prepares the web page WP2. In the example shown in Fig. 18, the history information "SCAN" is extracted from the URL "<http://xxx/SCAN/>". The URL pasted to the first page WP2 contains the history information. That is, the URL for specifying the read resolution 600 dpi is formed as "<http://xxx/SCAN/600/>" and the URL for specifying the read resolution 300 dpi is formed as "<http://xxx/SCAN/300/>".

If the user chooses the read resolution 600 dpi, the URL "<http://xxx/SCAN/600/>" is sent to the scanner 111. Since choosing of the resolution is followed by choosing of halftone processing in the example in Fig. 18, the scanner 111 prepares halftone processing page WP3 of the next choice menu and returns the page to the history information. The second page WP3 enables the user to choose a processing method between dither processing and error diffusion method. The URL related to the second page WP3 also contains history information. That is, when the second page WP3 is prepared, the history information is "SCAN/600," thus the URL for choosing the dither processing is formed as "<http://xxx/SCAN/600/Dither/>" and the URL for choosing the error diffusion method is formed as "<http://xxx/SCAN/600/Error/>".

Therefore, for example, if the user chooses the dither processing, the URL "<http://xxx/SCAN/600/Dither/>" containing all the choice history is sent to the scanner 111, which then converts the URL into control command and inputs the control command to the interpretation

section 115 for executing the requested scan processing.

The URL representation method is not limited to the above-given example. For example, a form of "<http://xxx/action=SCAN/resolution=600/algorithm=Dither/>" may be adopted. That is, the information indicating the parameter types (action, resolution, and algorithm) and the parameter values (SCAN, 600, and Dither) are represented in a set, whereby the processing contents can be clearly understood simply by seeing the URL.

The embodiment thus configured can also produce similar effects to those of the above-described embodiments because the control command is indirectly specified through the URL.

In addition, the fourth embodiment produces the following effects:

First, the scanner 111 prepares each web page and returns the page to the information terminal 61, thus the user can cause the scanner 111 to perform any desired operation simply by choosing the URL in the web page. That is, the web pages display predetermined processing items of read resolution, halftone processing method, etc., to which predetermined URLs are related in a one-to-one correspondence with each other, so that the user may choose any desired processing item and need not manually enter any complicated URL. Therefore, misoperation is prevented and ease of use can be enhanced.

Second, the URL contains history information of the processing items chosen in the past. Thus, storing of the URL history in the web server as in embodiments described later is not required and memory consumption, etc., can be saved.

The initial or default values of parameters are pre-set, whereby scan processing can also be performed without selecting all parameters.

5. Fifth embodiment

Next, a fifth embodiment of the invention will be discussed with reference to Fig. 19. The fifth embodiment is characterized by the fact that executable processing patterns are previously listed on a web page for scan processing.

Fig. 19 shows schematically how the information terminal 61 and the scanner 111 communicate with each other in the embodiment. If the user selects scanner processing out of an index page WP1, a scanner 111 prepares a scanner processing menu page WP11 and returns the page to an information terminal 61. The web page WP11 lists all executable processing patterns in the scanner 111.

That is, the web page W11 displays four processing patterns provided by combining two read resolutions of 600 dpi and 300 dpi and two halftone processing methods of dither processing and error diffusion method. URLs containing information for carrying out the processing patterns are related to the processing pat-

terns in a one-to-one correspondence with each other. For example, a URL of "http://xxx/SCN/600+Dither/" is related to a processing pattern for performing dither processing at read resolution 600 dpi and a URL of "http://xxx/SCN/300+Error/" is related to a processing pattern for executing the error diffusion method at read resolution 300 dpi.

Therefore, if the user selects any desired processing pattern out of the web page, the URL related to the processing pattern is sent to the scanner 111 and is converted into a predetermined command for performing scan processing.

The embodiment thus configured can also produce similar effects to those of the fourth embodiment. In addition, the processing patterns are previously listed in the fifth embodiment, it is not necessary to follow the web page hierarchy for selecting a desired processing pattern; ease of use is enhanced.

The fourth and fifth embodiments can also be combined. That is, principal parameters of read resolution, etc., are displayed as a processing pattern list and other parameters are selected out of a web page at a lower level.

6. Sixth embodiment

Next, a sixth embodiment of the invention will be discussed with reference to Figs. 20-22. The sixth embodiment is characterized by the fact that a management server is provided for managing business machines such as a scanner and a printer connected to a network.

6-1 Configuration

Fig. 20 is a block diagram to show the whole configuration of an image information processing system according to the embodiment. A management server 121 comprises a network connection section 122 for connecting the management server to a network 100 and a web server section 123 which comprises an HTTP request reception section 124, an HTTP response preparation section 125, a URL interpretation section 126, a job management section 127, a management table 128, and a web page preparation section 129.

The management table 128 is provided for managing URLs, control commands, etc., in correspondence with each other. It stores control commands of both scanners 131 and printers 132. The web page preparation section 129 prepares a predetermined web page and transmits the page to an information terminal 61, as described later.

The URL interpretation section 126 converts a URL received from the information terminal 61 into a control command based on the management table 128. The control command is transmitted from the job management section 127 through the network connection section 122 to a predetermined business machine. The job

management section 127 that can be represented as job management means, for example, keeps track of the operation state, etc., of each business machine connected to the network 100.

Each scanner 131 comprises a network connection section 42, an interpretation section 115, a drive control section 44, and an image data read section 43. That is, the scanner 131 need not have a web server function. Likewise, each printer 132 comprises a network connection section, a reception buffer an interpretation section, a print engine, etc., like a normal network printer.

6-2 Operation

Fig. 21 shows schematically how communication is executed among the information terminal 61, the management server 121, and the scanner 121.

First, when the information terminal 61 requests the web server section 123 of the management server 121 to transfer a general page WP21, the management server 121 returns the general page WP21 to the information terminal 61. The general page WP21 is a page indicating the business machines connected to the network 100 for each type, such as scanners and printers, as shown in Fig. 22.

If the user selects a scanner menu WP22 out of the general page WP21, the management server 121 returns the scanner menu WP22 to the information terminal 61. As shown in Fig. 22, the names, etc., of the scanners connected to the network 100 are displayed on the scanner menu WP22. If the user selects any desired scanner 131, the management server 121 returns an operation menu WP23 of the selected scanner 131 to the information terminal 61. As shown in Fig. 22, a parameter selection button for scan processing and an inquiry button about the operation state, etc., are displayed on the operation menu WP23. If scan processing is chosen, parameters can be selected out of one or more web pages as in the example shown in Fig. 18.

If the user chooses a desired parameter out of a read resolution choice page WP24 shown in Fig. 22, a URL indicating the parameter is sent to the management server 121. The URL interpretation section 126 of the management server 121 converts the received URL into a predetermined control command. The control command is transmitted to a predetermined scanner 131, which then interprets the control command, executes scan processing, and transfers an image file provided by scanning to the management server 121, which then transfers the image file received from the scanner 131 to the information terminal 61.

On the other hand, to inquire the operation state, etc., of the scanner 131 or the printer 132, the user chooses the "INQUIRE" out of the operation menu WP23, whereby the job management section 127 of the management server 121 returns the operation state, etc., of the specified machine to the information terminal 61. That is, management data such as the number of

jobs assigned to the specified machine and the job size, the wait time prediction value, and the like are sent to the information terminal 61. Although the scanner 131 is taken as an example in Fig. 21, the printer 132 is also provided with web pages WP31-WP33, as shown in Fig. 22.

The embodiment can also produce similar effects to those of the fourth embodiment because the control command of each machine can be indirectly specified through the URL. In addition, the sixth embodiment provides the management server 121 for managing the scanners 131 and the printers 132 and desired URLs are input from the web pages provided by the management server 121, whereby the machines are operated. Thus, normal network printers and network scanners can be easily operated through the web browser and further the user can keep track of the operation state, the wait time, etc., of each machine.

The web server section may also be installed in each machine of the scanners 131 and the printers 132 so as to execute HTTP communication among the machines 131, 132, the management server 121, and the information terminal 61. In this case, the management server 121 can be made to serve as a proxy server.

7. Seventh embodiment

Next, a seventh embodiment of the invention will be discussed with reference to Fig. 23. The seventh embodiment is characterized by the fact that whenever a processing item is selected, prescan is executed and an image file provided by the prescan is returned to an information terminal as a web page.

Scanner processing according to the seventh embodiment is shown on a flowchart of Fig. 23.

When an HTTP request is received from an information terminal 61 at step S91, URLs are extracted at step S92. The extracted URLs are converted into control commands in order starting at the top at step S93 and the control commands are saved in a buffer at step S94 until completion of the URL conversion at step S95. Whether or not prescan is to be executed is determined at step S96. For example, a scan start button is provided in a web page and if the scan start button is not operated, it can be determined that prescan is to be executed.

If it is determined that prescan is to be executed, history information is extracted from the input URL at step S97, a new URL is prepared at step S98, and a web page to which the new URL is related is prepared at step S99. The control command based on the input URL is input to the interpretation section 115 as step S100 and scan is executed at step S101. The scan at step S101 becomes prescan. Even if the user does not specify all parameters, prescan can be executed. That is, the initial (default) values of the parameters are pre-set and if the user omit some parameters, the initial (default) values of the parameters are assumed to be specified for executing prescan.

The image provided by the prescan is prepared as a predetermined image file at step S102 and an HTTP response is prepared at step S103 and is returned to the information terminal 61 at step S104. The URL specifying the prescan image file is contained in the web page prepared at step S99. Therefore, whenever the user selects a parameter of read resolution, etc., a prescan image can be provided based on the selection result.

On the other hand, it is determined that scan is to be executed as the scan start button is operated, etc., steps S97-S99 are skipped and control goes to step S100.

The embodiment thus configured can also produce similar effects to those of the fourth embodiment. In addition, in the seventh embodiment, prescan is executed each time a parameter of read resolution, etc., is selected, prescan is executed, so that the user can select a parameter while checking the processing result.

8. Eighth embodiment

Next, an eighth embodiment of the invention will be discussed with reference to Fig. 24. The eighth embodiment is characterized by the fact that a history of selected processing items is saved in a scanner.

Scanner processing according to the embodiment is shown on a flowchart of Fig. 24. It contains steps S71-S73 and S77-S84 shown in Fig. 17.

In the embodiment, if it is determined at step S73 that scan is not to be executed, the processing items selected with URLs are extracted and are saved in a buffer at step S110. That is, the processing items indicated by the URLs are temporarily saved in the buffer and if it is determined that scan is to be executed, the saved processing items are converted into a control command at steps S77-S79. For example, if a URL of "http://xxx/300/" is input, the "/300/" part is saved. Next, if a URL of "http://xxx/Error/" is input, the "/Error/" part is saved. To execute scan, the saved URL parts are converted into a control command, which then is input to an interpretation section 115.

Therefore, the embodiment eliminates the need for generating a new URL containing history information of input URLs for preparing web pages.

The embodiment thus configured can also produce similar effects to those of the fourth embodiment.

9. Ninth embodiment

Next, a ninth embodiment of the invention will be discussed with reference to Fig. 25. The ninth embodiment is characterized by the fact that an information terminal monitors a URL selection history and transfers a URL containing the selection history in response to a request made by a web server section of a machine.

Fig. 25 is a flowchart to show URL monitoring executed by an information terminal 61. For example, when the information terminal 61 first accesses a scanner 111,

the monitoring program can be sent from the scanner 111 to the information terminal 61 and can be started in the information terminal 61.

First, the information terminal 61 monitors input of a URL at step S121. If a URL is entered, history information of the URL is saved in a memory of the information terminal 61 at step S122. That is, for example, if the user of the information terminal 61 enters a URL of "http://xxx/600," the "/600/" part is saved. Each time a URL is entered, it is stored in the information terminal 61.

On the other hand, no URL is entered, whether or not a history information transfer request is received from a web server section 112 of the scanner 111 is determined at step S123. If a history information transfer request is received, the saved history information is read at step S124, a new URL containing all the selection contents is prepared at step S125 and is transferred to the scanner 111 at step S126. At step S122, all of the URL rather than a part thereof may be saved.

The embodiment thus configured can also produce similar effects to those of the fourth embodiment. In addition, the information terminal 61 monitors URL selection history and last transmits the URL containing all the selection history, to the scanner 111, thus memory and CPU resource consumption of the scanner can be saved.

It is further understood by those skilled in the art that the foregoing description is preferred embodiments of the disclosed system and that various changes and modifications may be made in the invention without departing from the spirit and scope thereof.

For example, as shown in Fig. 13, a program, etc., for embodying the invention is stored on a recording medium 93 and the storage contents of the recording medium 93 can be loaded into the scanner 41 through an I/F 92 and the information terminal 61. A predetermined program can also be downloaded directly into the scanner 41. In addition to a physical recording media, such as floppy disk, CD-ROM, DVD-ROM, and memory card, a communication medium using a communication line for downloading is available as the recording medium 93.

Further, a password or a personal identification number required for accessing the image information input-output unit is provided so that only the persons who have access to the image information input-output unit can operate the image information input-output unit.

If the web server section is provided with an HTML format file for displaying image information input-output unit status information, such as the fed paper size and the remaining toner amount, the image information input-output unit status can be easily checked from the information terminal. Appropriate HTML format files for displaying manuals and an error recovery procedure (troubleshooting) can also be sent to the information terminal as required in response to the status. That is, only required online manuals can also be read on the information terminal in response to the status of the installed

option type such as a double-sided printing mechanism, the printing paper type, etc.

Further, in the embodiments, two types of image information input-output units of scanner and printers have been taken as examples, but the invention is not limited to them. For example, the invention can also be applied widely to various image information input-output units, such as digital still-video cameras, digital video cameras, and liquid crystal displays. For example, for the digital still-video cameras, the digital video cameras, etc., the setup values of the shutter speed, exposure, the image type of still or moving image, voice input option, etc., can be specified indirectly through the read retrieval means such as the web browser. For the liquid crystal displays, the setup values of display resolution, gradation, etc., can be handled indirectly through the web browser.

As we have discussed, according to the image information input-output unit, control information to control the operation of the image processing means can be specified indirectly by retrieval information or command information, thus it is not necessary to install dedicated driver software, etc., in the information terminal, and the image information input-output unit can be operated seamlessly under the unified operation environment.

Particularly, the hypertext information retrieval environment is installed in the image information input-output unit and retrieval information to use the information retrieval environment can be used to indirectly specify control information, thus a new program need not be installed in the information terminal and operability can be improved. Therefore, the user need not learn the use method of a control program such as driver software. The memory capacity mounted in the information terminal can be decreased.

Further, control information is specified indirectly by resource request information containing history information of selected processing items, thus neither the information terminal nor the image information input-output unit needs to hold the processing item selection history and the system configuration can be simplified.

Claims

1. An image information input-output unit comprising:

a hypertext information retrieval environment; image processing means for processing of image information; management means for managing retrieval information and control information in correspondence with each other; conversion means for looking up in said management means based on the entered retrieval information and converting the retrieval information into the predetermined control information; and

control means for controlling operation of said image processing means based on the control information into which the retrieval information is converted by said conversion means.

2. The image information input-output unit as claimed in claim 1, wherein said management means relates a sample image generation request to predetermined retrieval information for managing them, and wherein

said information retrieving means comprises:

sample image generation means for generating prediction results of image information input-output processing based on a plurality of preset control information pieces as sample images if the sample image generation request occurs as the predetermined retrieval information is entered;

sample image list information generation means for generating sample image list information for relating the retrieval information pieces corresponding to the sample images to the sample images and listing the same; and transfer means for transferring the sample image list information to the retrieval information entry source.

3. A control method for controlling an image information input-output unit comprising a hypertext information retrieval environment and management means for managing retrieval information and control information in correspondence with each other for driving image processing means based on the control information, thereby performing input-output processing of image information, said control method comprising the steps of:

receiving the retrieval information;
looking up in said management means based on the received retrieval information and converting the retrieval information into the predetermined control information;
controlling operation of said image processing means based on the control information into which the retrieval information is converted; and
transferring image information provided by said image processing means to an entry source of the retrieval information.

4. The control method as claimed in claim 3, further comprising the steps of:

relating a sample image generation request to predetermined retrieval information for managing them in said management means;
determining whether or not the sample image

generation request is received;
generating prediction results of image information input-output processing based on a plurality of preset control information pieces as sample images if the sample image generation request is received;
generating sample image list information for relating the retrieval information pieces corresponding to the sample images to the sample images and listing the same; and
transferring the sample image list information to the retrieval information entry source.

5. The control method as claimed in claim 3 or 4, further comprising the step of receiving data to be processed by said image processing means.

6. An image information processing system comprising:

an image information input-output unit having a hypertext information retrieval environment; and
an information terminal having read retrieval means for reading and retrieving the information retrieval environment,

wherein said image information input-output unit comprises,

management means for managing retrieval information and the control information in correspondence with each other;
conversion means for looking up in said management means based on the retrieval information entered through said read retrieval means and converting the retrieval information into predetermined control information; and
control means for controlling operation of image processing means based on the control information into which the retrieval information is converted by said conversion means.

7. The image information processing system as claimed in claim 6, wherein said management means relates a sample image generation request to predetermined retrieval information for managing them, and wherein

said information retrieval environment comprises:

sample image generation means for generating prediction results of image information input-output processing based on a plurality of preset control information pieces as sample images if the sample image generation request occurs as the predetermined retrieval information is received from said read retrieval means;

sample image list information generation means for generating sample image list information for relating the retrieval information pieces corresponding to the sample images to the sample images and listing the same; and transfer means for transferring the sample image list information to said read retrieval means

8. An image information input-output unit for driving image processing means based on control information, thereby performing input-output processing of image information, said image information input-output unit comprising:

management means for managing control information and command information related to processing items that can be processed by said image processing means in correspondence with each other;

reception means for receiving a request for transferring a processing list information indicating the processing items processed by said image processing means;

processing list information generation means for relating command information pieces to the processing list information pieces and returning the information pieces to the processing list information transfer requester if the processing list information transfer request is received;

conversion means for converting the command information into predetermined control information based on said management means if the command information is entered based on the processing list information; and control means for causing said image processing means to perform the processing item based on the predetermined control information into which the command information is converted.

9. The image information input-output unit as claimed in claim 8, wherein the processing list information is information listing prediction results of image processing performed by said image processing means as sample images.

10. An image information processing system comprising:

an image information input-output unit for driving image processing means based on control information, thereby performing input-output processing of image information; and

an information terminal for entering information in said image information input-output unit, thereby causing said image information input-output unit to perform desired image process-

ing, wherein said image information input-output unit comprises,

management means for managing control information and command information related to processing items that can be processed by said image processing means in correspondence with each other, reception means for receiving a request for transferring a processing list information indicating the processing items processed by said image processing means from said information terminal,

processing list information generation means for relating command information pieces to the processing list information pieces and returning the information pieces to said information terminal if the processing list information transfer request is received,

conversion means for converting the command information into predetermined control information based on said management means if the command information is entered from said information-terminal based on the processing list information, and

control means for causing said image processing means to perform the processing item based on the predetermined control information into which the command information is converted, and wherein

said information terminal comprises,

processing list information transfer request generation means for generating the processing list information transfer request,

selection means for selecting a desired processing item based on the processing list information returned from said processing list information generation means; and selection information input means for entering the command information related to the selected processing item in said image information input-output unit.

11. The image information processing system as claimed in claim 10, wherein the processing list information is information listing prediction results of image processing performed by said image processing means as sample images.

12. The image information processing system as claimed in claim 10 or 11, wherein said information terminal further includes storage means for saving

the selected command information.

13. A program recording medium for recording a computer-readable program for driving image processing means based on control information, thereby performing input-output processing of image information said program recording medium for recording the program for causing a computer to provide:

a function of generating a hypertext information retrieval environment;
a management function of managing retrieval information for using the information retrieval environment and the control information in correspondence with each other; and
a conversion function of converting entered retrieval information into predetermined control information.

14. The program recording medium as claimed in claim 13, wherein said management function relates a sample image generation request to predetermined retrieval information for managing them, and wherein

said program causes said computer to further provide:

a sample image generation function of generating prediction results of image information input-output processing based on a plurality of preset control information pieces as sample images if the sample image generation request occurs as the predetermined retrieval information is entered;

a sample image list information generation function of generating sample image list information for relating the retrieval information pieces corresponding to the sample images to the sample images and listing the same; and
a transfer function of transferring the sample image list information to the retrieval information entry source.

15. A program recording medium for recording a computer-readable program for driving image processing means based on control information, thereby performing input-output processing of image information said program recording medium for recording the program for causing a computer to provide:

a management function of managing control information and command information related to processing items that can be processed by said image processing means in correspondence with each other;

a reception function of receiving a request for transferring a processing list information indicating the processing items processed by said

image processing means;
a processing list information generation function of relating command information pieces to the processing list information pieces and returning the information pieces to the processing list information transfer requester if the processing list information transfer request is received; and
a conversion function of converting the command information into predetermined control information based on said management means if the command information is entered based on the processing list information.

16. The program recording medium as claimed in claim 15, wherein the processing list information is information listing prediction results of image processing performed by said image processing means as sample images.

17. An image information input-output unit with a web server function, comprising:

image processing means for processing image information;
web page generation means for generating a web page having resource request information related to processing items that can be processed by said image processing means;
management means for managing the resource request information and the control information in correspondence with each other;
conversion means for converting the resource request information selected through the web page into predetermined control information based on said management means; and
control means for controlling operation of said image processing means based on the control information into which the resource request information is converted.

18. The image information input-output unit as claimed in claim 17, wherein the resource request information contains history information of the selected processing item.

19. The image information input-output unit as claimed in claim 18, wherein said web page generation means analyzes received resource request information, detects the history information, and relates the resource request information containing the history information to the processing item, thereby generating the web page.

20. The image information input-output unit as claimed in claim 17, wherein the web page lists processing patterns that can be processed by said image processing means and the resource request infor-

mation pieces for realizing the processing patterns are related to the processing patterns.

21. A control method for controlling an image information input-output unit with a web page function including management means for managing the resource request information and the control information in correspondence with each other for driving image processing means based on the control information, to perform input-output processing of image information, said control method comprising the steps of:

(a) generating a web page having resource request information related to processing items that can be processed by said image processing means;

(b) receiving resource request information specified through the web page;

(c) converting the received resource request information into predetermined control information based on said management means;

(d) controlling operation of said image processing means based on the control information into which the resource request information is converted; and

(e) preparing a web page containing image information provided by said image processing means and transferring the web page to the resource request information entry source.

22. The control method as claimed in claim 21, wherein the resource request information contains history information of the selected processing item.

23. The control method as claimed in claim 22, wherein said first step web analyzes received resource request information, detects the history information, and relates the resource request information containing the history information to the processing item, thereby generating the web page.

24. The control means as claimed in claim 21, wherein the web page lists processing patterns that can be processed by said image processing means and the resource request information pieces for realizing the processing patterns are related to the processing patterns.

25. An image information processing system comprising

an image information input-output unit having a web server function; and

an information terminal having a web browser for using the web server function, wherein said image information input-output unit comprises,

image processing means driven based on control information,

web page generation means for generating a web page having resource request information related to processing items that can be processed by said image processing means and transmitting the web page to said information terminal,

management means for managing the resource request information and the control information in correspondence with each other,

conversion means for converting the resource request information selected through the web page according to the web browser into predetermined control information based on said management means, and

control means for controlling operation of said image processing means based on the control information into which the resource request information is converted.

26. The image information processing system as claimed in claim 25, wherein the resource request information contains history information of the selected processing item.

27. The image information processing system as claimed in claim 26, wherein said web page generation means analyzes received resource request information, detects the history information, and relates the resource request information containing the history information to the processing item, thereby generating the web page.

28. The image information processing system as claimed in claim 25, wherein the web page lists processing patterns that can be processed by said image processing means and the resource request information pieces for realizing the processing patterns are related to the processing patterns.

29. A program recording medium for recording a computer-readable program for driving image processing means based on control information, thereby performing input-output processing of image information, said program recording medium for recording the program for causing a computer to provide:

a web server function of providing a web page in response to resource request information; a web page generation function of generating a web page having resource request information related to processing items that can be processed by said image processing means; management means for managing the resource request information and the control in-

formation in correspondence with each other;
and

conversion means for converting the resource
request information selected through the web
page into predetermined control information
based on said management function. 5

30. The program recording medium as claimed in claim
29, wherein the resource request information contains
history information of the selected processing
item. 10

31. The program recording medium as claimed in claim
30, wherein said web page generation function analyzes
received resource request information, detects the
history information, and relates the resource request
information containing the history information to the
processing item, thereby generating the web page 15

32. The program recording medium as claimed in claim
29, wherein the web page lists processing patterns
that can be processed by said image processing
means and the resource request information pieces
for realizing the processing patterns are related to
the processing patterns. 20 25

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FIG.1

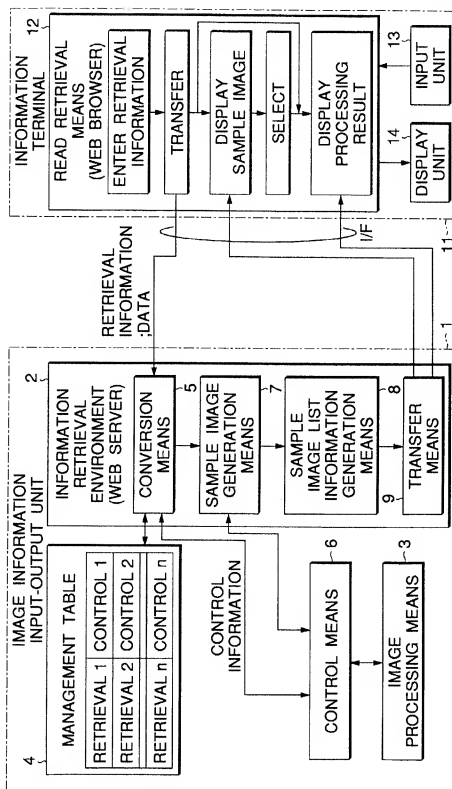


FIG.2

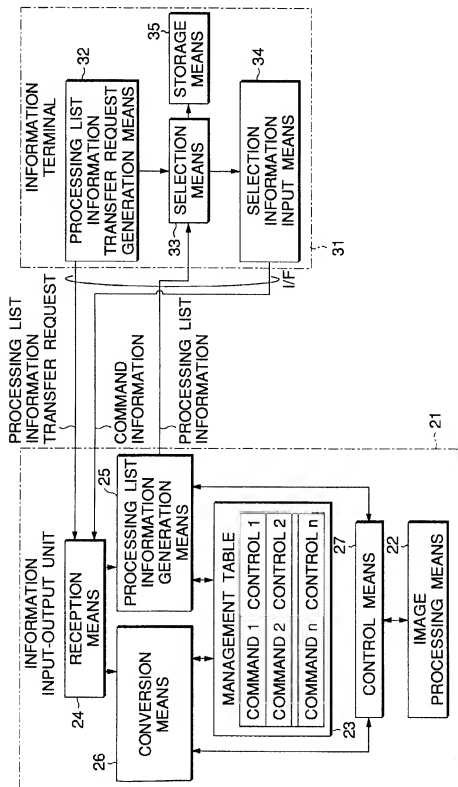


FIG.3

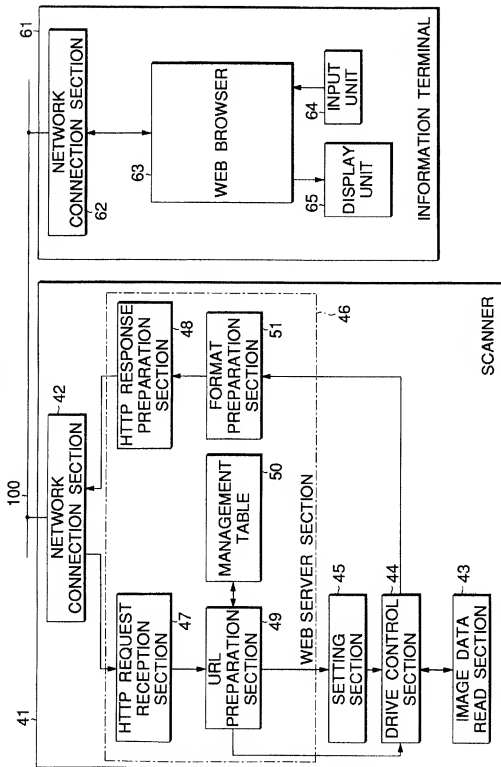


FIG.4

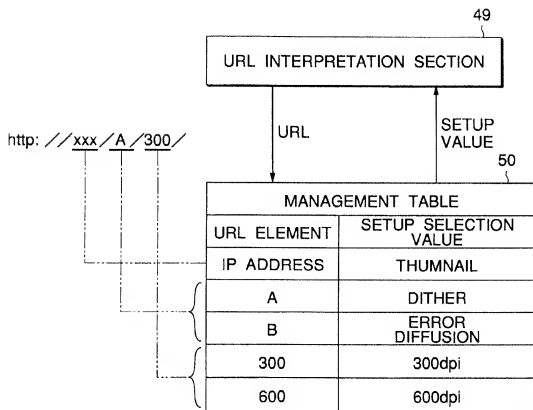


FIG.5

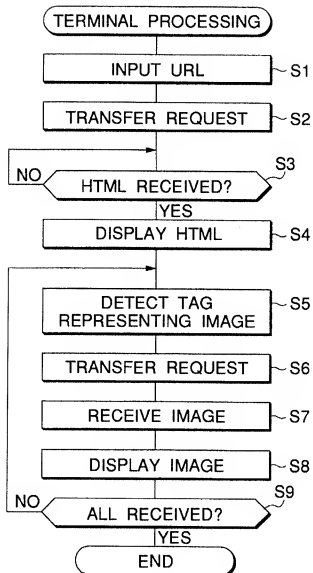


FIG.6

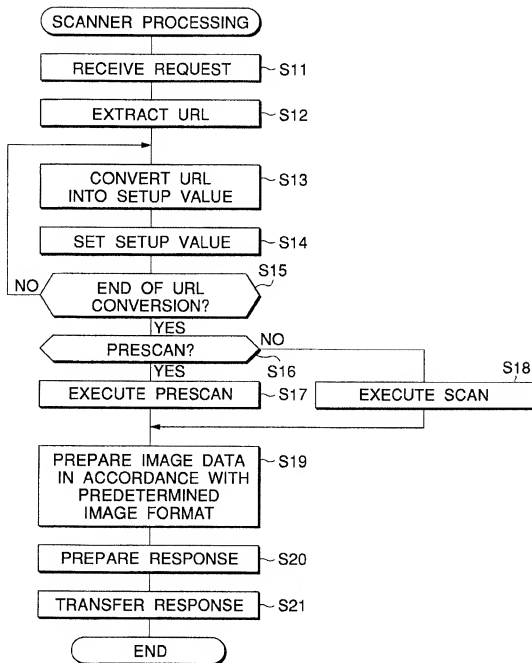


FIG.7

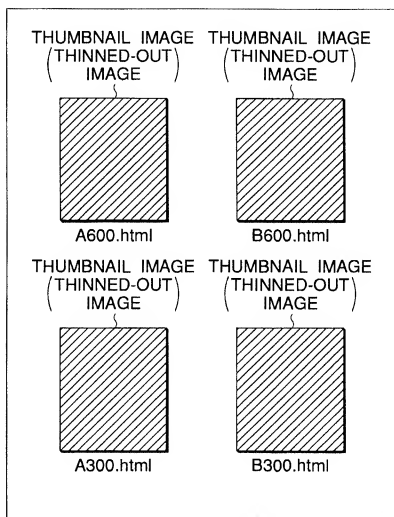
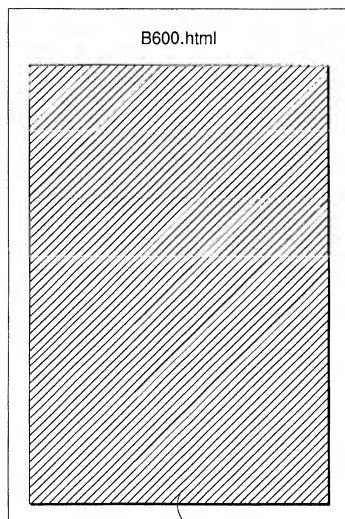


FIG.8



INTRINSIC IMAGE PROVIDED ACCORDING
TO SELECTED SETUP VALUE

FIG.9

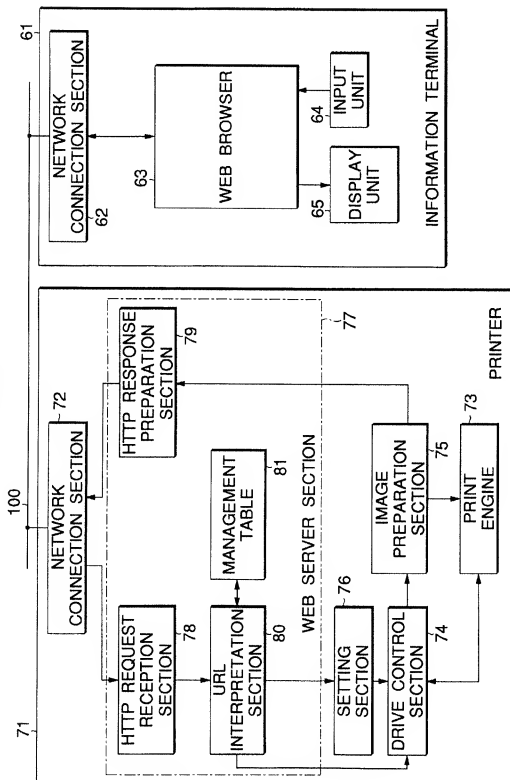


FIG.10

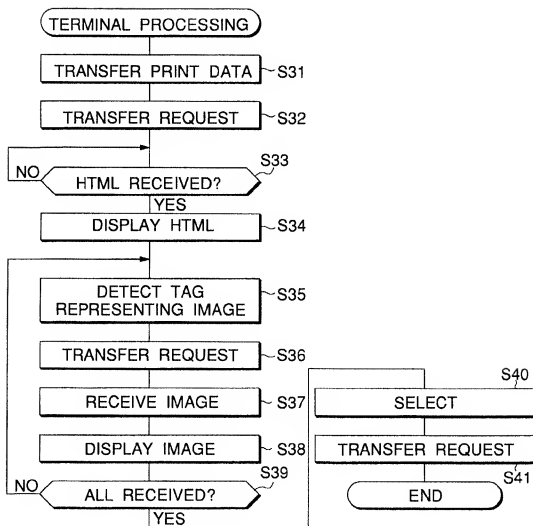


FIG.11

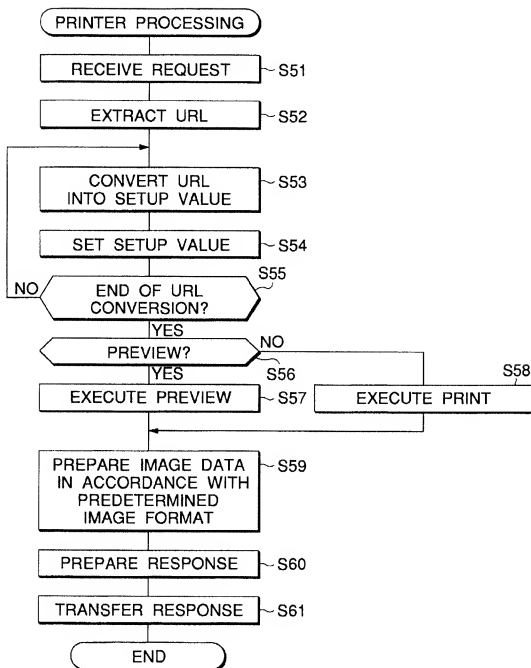


FIG.12

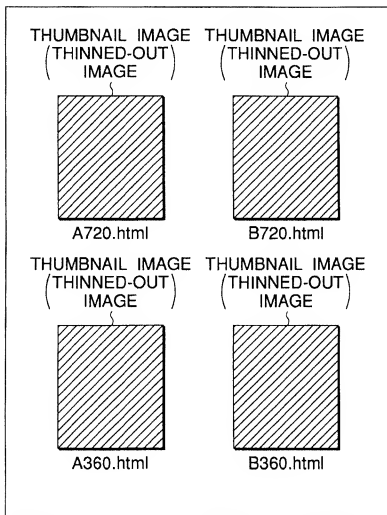


FIG.13

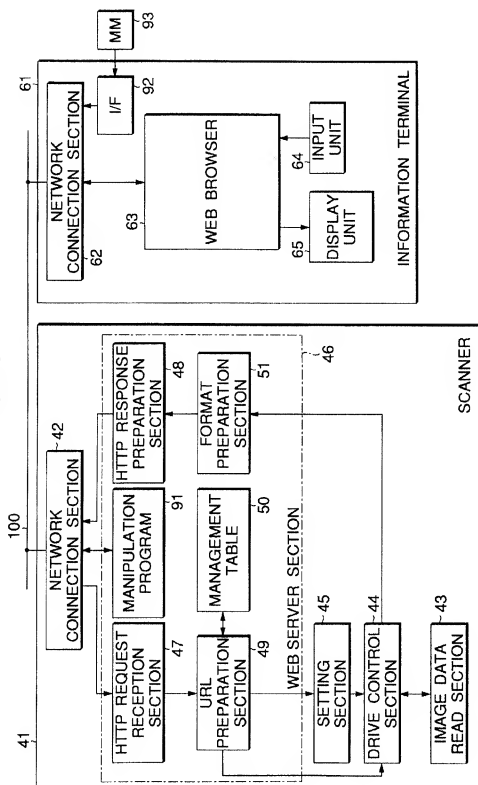


FIG.14

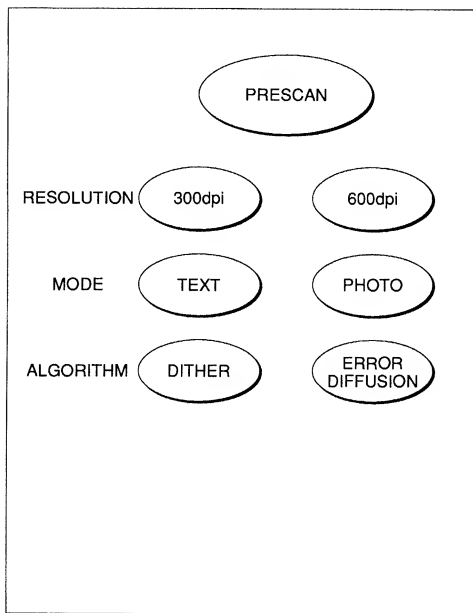


FIG.15

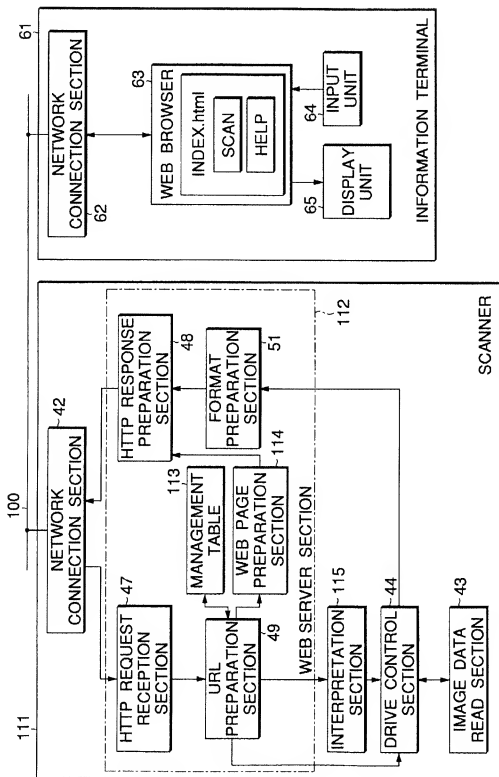


FIG.16

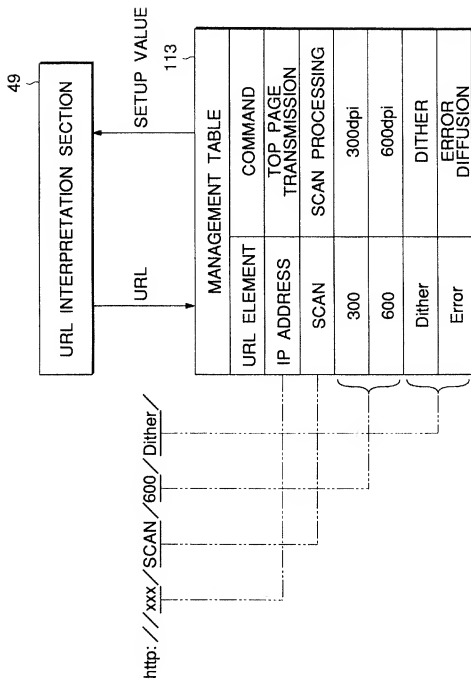


FIG.17

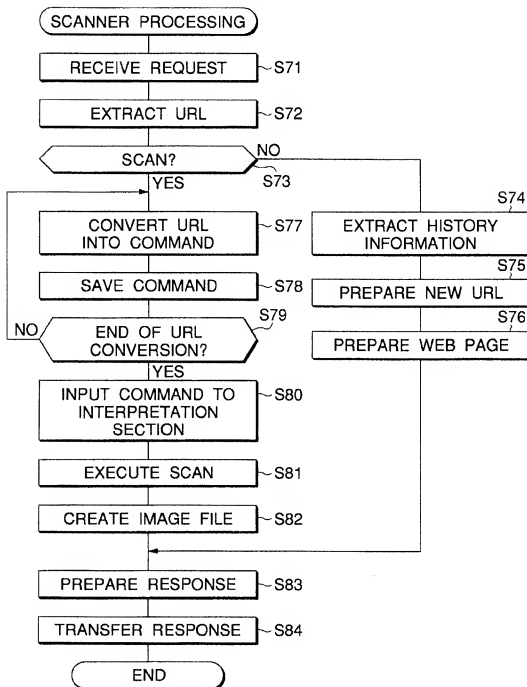


FIG.18

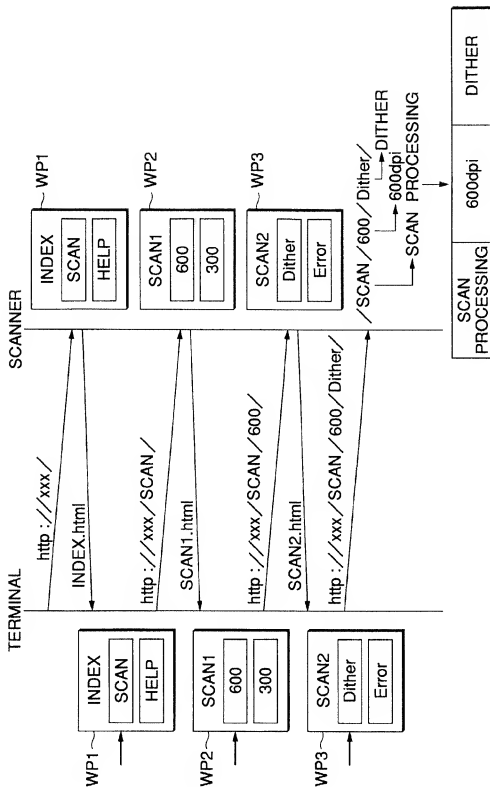


FIG.19

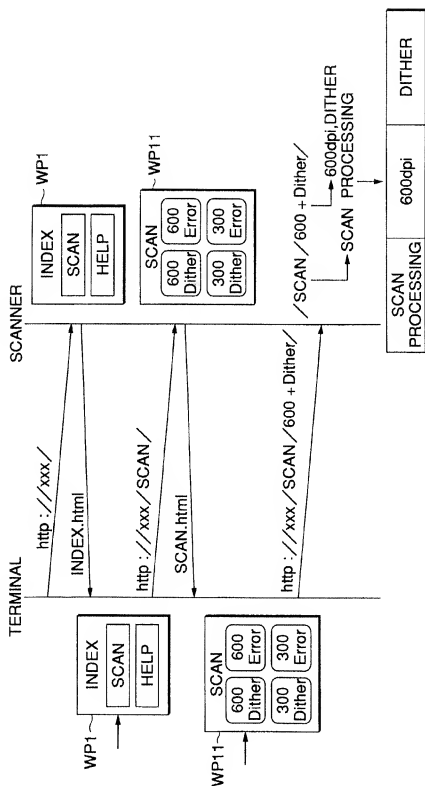


FIG.20

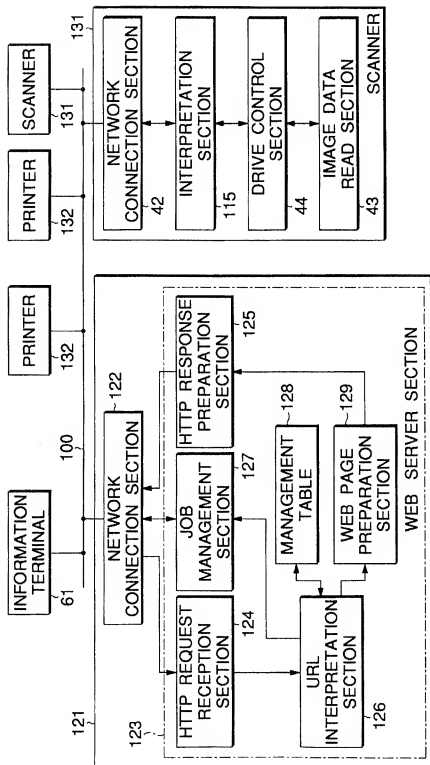


FIG.21

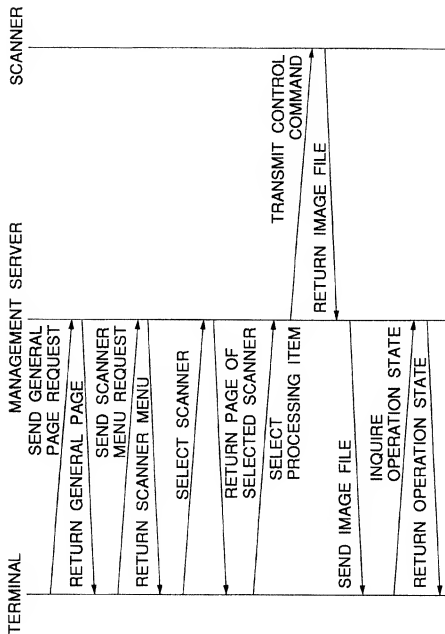


FIG.22

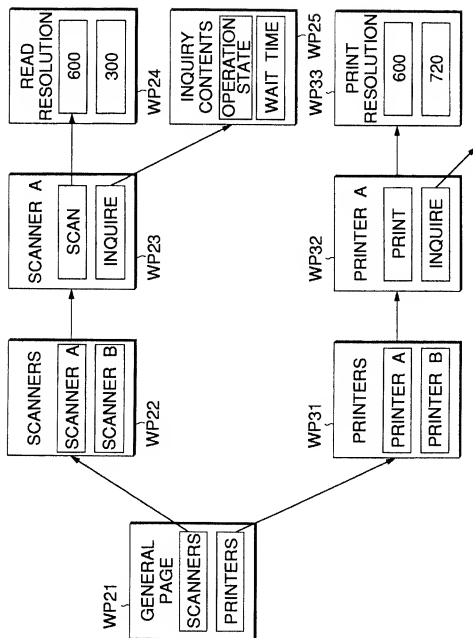


FIG.23

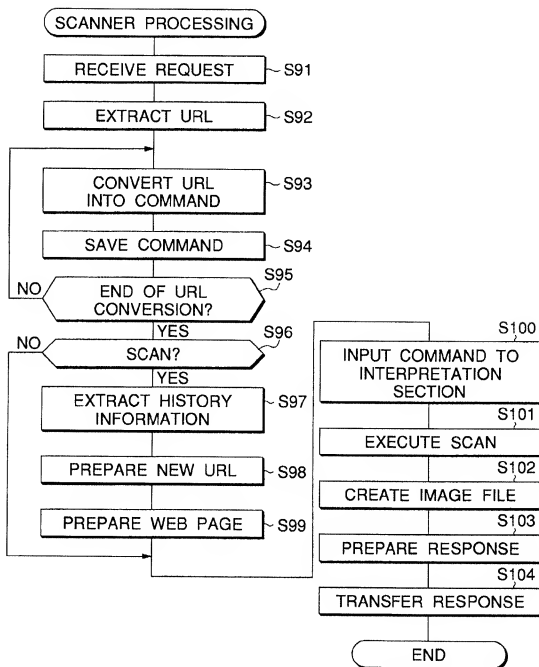


FIG.24

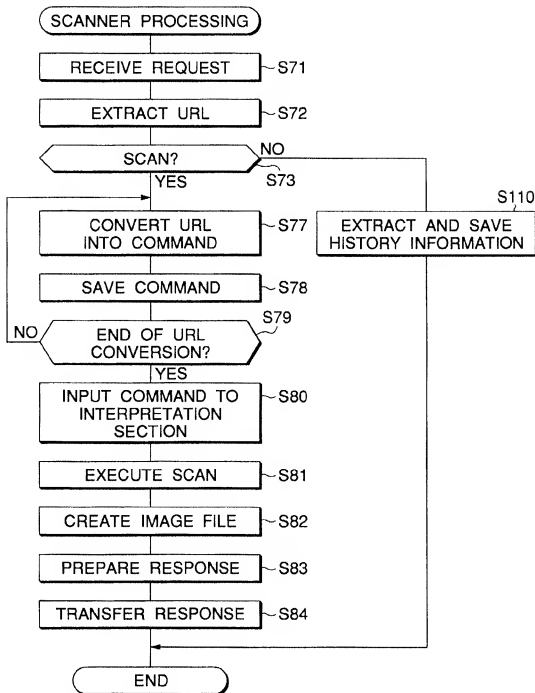


FIG.25

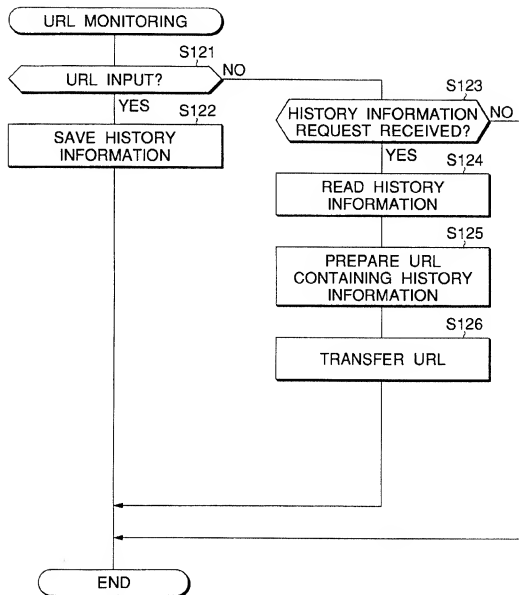


Exhibit C

Electronic Acknowledgement Receipt

EFS ID:	2702567
Application Number:	09497383
International Application Number:	
Confirmation Number:	7431
Title of Invention:	System and method for scanning a document in client/server environment
First Named Inventor/Applicant Name:	David L. Bahr
Customer Number:	826
Filer:	Christopher Shawn Haggerty
Filer Authorized By:	
Attorney Docket Number:	7204
Receipt Date:	11-JAN-2008
Filing Date:	03-FEB-2000
Time Stamp:	10:31:40
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes) /Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Filed	258663IDS.pdf	781368 6cd043d024793ba1e75659d1949ec42517e022ef	no	4

Warnings:

Information:

2	NPL Documents	258663CanadianOA.PDF	426992	no	4
			662a4f4a8d8b1585f275e7b6b72e1873 R4207		

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eFiled Application Information

EFS ID	2702567
Application Number	09497383
Confirmation Number	7431
Title	System and method for scanning a document in client/server environment
First Named Inventor	David L. Bahr
Customer Number or Correspondence Address	826
Filed By	Christopher Shawn Haggerty
Attorney Docket Number	7204
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Receipt Date	11-JAN-2008
Application Type	Utility under 35 USC 111 (a)

Application Details

Submitted Files	Page Count	Document Description	File Size	Warnings
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258663CanadianOA.PDF	4	NPL Documents	426992 bytes	◆ PASS

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(Not for submission under 37 CFR 1.99)

Application Number	09497383
Filing Date	2000-02-03
First Named Inventor	David Bahr
Art Unit	2143
Examiner Name	Neurauter, George C.
Attorney Docket Number	047307/258663

U.S. PATENTS

Examiner Initial*	Cite No	Patent Number	Kind Code ¹	Issue Date	Name of Patentee or Applicant of cited Document	Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear
	1	5602936		1997-02-11	Green, et al.	

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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	09497383
Filing Date	2000-02-03
First Named Inventor	David Bahr
Art Unit	2143
Examiner Name	Neurauter, George C.
Attorney Docket Number	047307/258863

1

Canadian Associate Office Action received November 15, 2007.



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**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

Application Number	09497383
Filing Date	2000-02-03
First Named Inventor	David Bahr
Art Unit	2143
Examiner Name	Neurauter, George C.
Attorney Docket Number	047307/258663

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Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

- ☒ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

- ☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

- ☐ See attached certification statement.
- ☐ Fee set forth in 37 CFR 1.17 (p) has been submitted herewith.
- ☐ None

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Jon M. Jurgovan/	Date (YYYY-MM-DD)	2008-01-11
Name/Print	Jon M. Jurgovan	Registration Number	34,633

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. **DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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November 9, 2007

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K2P 0A2

Application No. : **2,400,010**
Owner : CHARTONE, INC.
Title : **SYSTEM AND METHOD FOR SCANNING A DOCUMENT
IN CLIENT/SERVER ENVIRONMENT**
Classification : H04N 1/00 (2006.01)
Your File No. : **7204-38549**
Examiner : Gilbert Jean

**YOU ARE HEREBY NOTIFIED OF A REQUISITION BY THE EXAMINER IN
ACCORDANCE WITH SUBSECTION 30(2) OF THE PATENT RULES. IN ORDER TO
AVOID ABANDONMENT UNDER PARAGRAPH 73(1)(A) OF THE PATENT ACT, A
WRITTEN REPLY MUST BE RECEIVED WITHIN **SIX MONTHS** AFTER THE ABOVE
DATE.**

This application has been examined taking into account applicant's correspondence received in this office on April 16, 2007.

The number of claims in this application is 71.

Reference re-applied

D1: EP 867,817

Sep. 30, 1998

G06F 17/30

Shima et al.

A further search of the prior art has revealed the following:

Canada

OPIC  CIPO

*Reference applied***D2: US 5,602,936****Feb. 11, 1997****G06K 9/00****Green et al.**

D1 discloses a scanner that provides a web browser section wherein an entered URL is converted into a setup value by the URL interpretation section. The setup values are set in a drive control section, whereby an image is read under a desired read condition.

D2 discloses a method and apparatus for recapturing data from scanning devices and storing the captured data in digital form using a method that allows for easy access for viewing, printing, and transmitting.

Obviousness

The subject of the present application relates to a method of transmission of data between client devices and servers coupled by one or more networks. The method can be used to transfer documents in electronic form between parties in mortgage lending transactions or in court proceedings, for example.

In the last correspondence, it was argued that the cited references do not disclose an index field portion.

Claim 1 recites a method comprising the step of:

- generating a display based on a hypertext mark-up language (HTML) document stored in a client device using a web browser of a user interface of the client device.

D1 discloses an image information input-output wherein a user accesses an information terminal that can issue retrieval information when using the hypertext information retrieval environment. Therefore, the user can access the image information input-output without installing special driver software (column 3, lines 55 to 58).

- a document display portion including a display of document data received from a scanner coupled to the client device.

D1 discloses an image information input-output unit of a scanner that comprises a display unit for displaying the result of reading the information retrieval environment (column 5, lines 49 to 58).

- the index field portion permitting index data to be input by a user with an input device of the client device into the user interface in association with the document data.

D2 discloses a method and apparatus for recapturing data from scanning devices wherein a user selects the image to display based on a set of logical indexes that were built for each corresponding image at the time the image was read and scanned (abstract, column 2, lines 53 to 62).

- a control portion for generating a start scan signal to initiate scanning of the document with the scanner to generate the document data.

D1 discloses an image information input-output that comprises control information means for controlling the operation of the image processing means (column 3, lines 19 to 29).

D1 does not disclose an index field portion permitting index data to be input by a user with an input device of the client device into the user interface in association with the document data. However, D2 discloses a method and apparatus for recapturing data from scanning devices wherein a user selects the image to display based on a set of logical indexes that were built for each corresponding image at the time the image was read and scanned.

Therefore, claim 1 is found obvious in view of D1 and common knowledge of document processing systems as disclosed by D2.

The remaining claims introduce limitations such as: a method wherein the control element can be activated by the user with the input device to decrease the scale of the display of the document data (claim 5) or a system wherein the client device includes a personal computer (claim 49), which do not patentably distinguish over claim 1. The subject matter of claims 1 to 71 would have been obvious on the claim date to a person skilled in the art or science to which they pertain having regard to D1 and D2, in light of common knowledge as disclosed by D2 and do not comply with section 28.3 of the *Patent Act*.

Indefiniteness

Claims 1, 9, 26, and 53 are unclear, the preamble "a method comprising" does not categorize the present application in accordance with the scope of the application. A preamble such as: "a method for scanning a document in client/server environment" would be appropriate.

Claim 1, line 2 is unclear, the inclusion of "generating a display" causes ambiguity. The method does not define the inputs needed to generate a display.

Furthermore, the inclusion of "generating a start scan signal to initiate scanning of the document", line 12 causes ambiguity. The claim recites a display including a document display portion, an index field portion, and a control portion. The document display portion includes a display of document data received from a scanner. It is unclear how the control portion, in the same display as the document display portion, can initiate the scanning of a document already scanned in the document display portion.

Therefore, claims 1, 9, 26, and 53 do not comply with subsection 27(4) of the *Patent Act*.

In view of the foregoing defects, the applicant is requisitioned, under subsection 30(2) of the *Patent Rules*, to amend the application in order to comply with the *Patent Act* and the *Patent Rules* or to provide arguments as to why the application does comply.

United States Patent [19]

Green et al.

[11] Patent Number:

5,602,936

[45] Date of Patent:

Feb. 11, 1997

[54] METHOD OF AND APPARATUS FOR DOCUMENT DATA RECAPTURE

[75] Inventors: **W. Thomas Green, Carrollton; R. Keith Lynn, Roswell, both of Ga.**

[73] Assignee: **Greenway Corporation, Carrollton, Ga.**

[21] Appl. No.: **394,570**

[22] Filed: **Feb. 27, 1995**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 237,757, May 4, 1994, abandoned, which is a continuation-in-part of Ser. No. 6,543, Jan. 21, 1993, abandoned.

[51] Int. Cl.⁶ **G06K 9/00**

[52] U.S. Cl. **382/140; 382/305**

[58] Field of Search 382/137, 138, 382/139, 140, 305, 306; 235/379; 364/401, 408

[56] References Cited

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Primary Examiner—Leo Boudreau

Assistant Examiner—Phuoc Tran

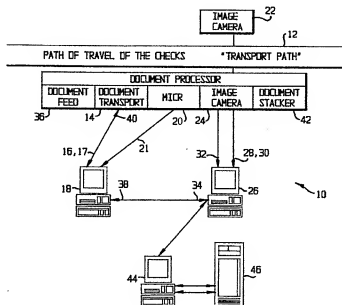
Attorney, Agent, or Firm—Wigman, Cohen, Leiner & Myers, P.C.

[57]

ABSTRACT

A method of and apparatus for recapturing data from scanning devices and storing the captured data in digital form using a method that allows for easy, fast and reliable access for viewing, printing, transmitting, et cetera. More specifically, the method of the present invention allows institutions such as banks to "touch" data that has been captured using high speed reader/sorter devices. The invention interacts with such devices to store scanned digital images to storage devices using a hierarchical storage management module in order to migrate less accessed images to more cost effective storage media, such as optical disk and/or tape. Users access copies of the scanned items using an application that queries a database that holds pointers to the actual location of the physical digital image. The location of the scanned image is transparent to the end-user. The user selects the image to display based on a set of logical indexes that were built for each corresponding image at the time the image was read and scanned. Indexes include such information as date, account number, check number and amount. The user then has the option to view, print, or fax the images that were retrieved. In the case of banks, those images can be sent to the customer instead of the actual checks for a fraction of the cost in postage.

12 Claims, 7 Drawing Sheets



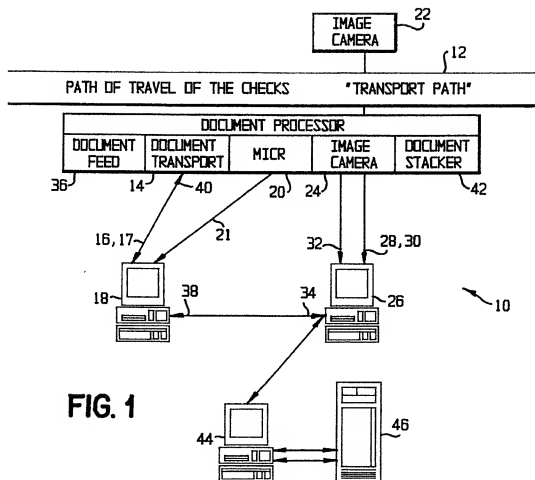


FIG. 1

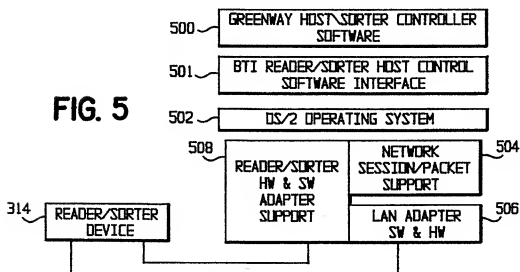


FIG. 2

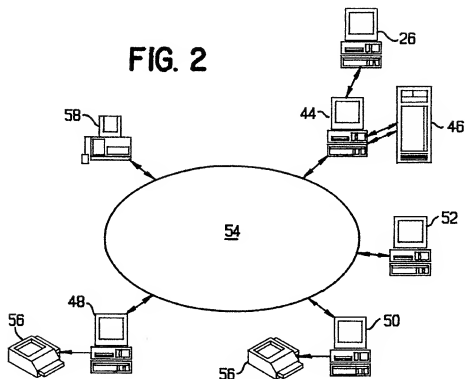
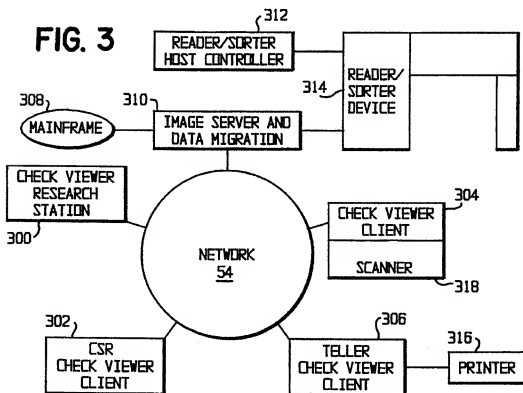


FIG. 3



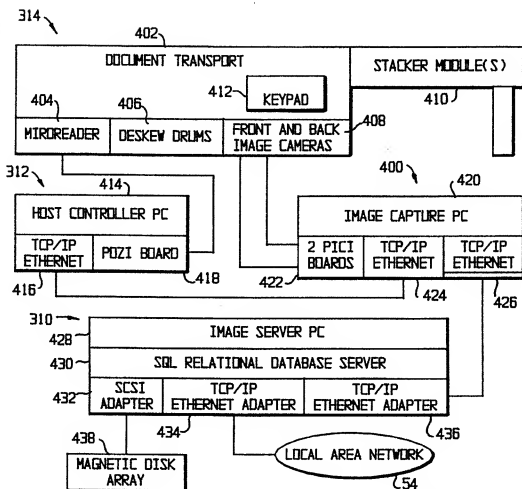


FIG. 4

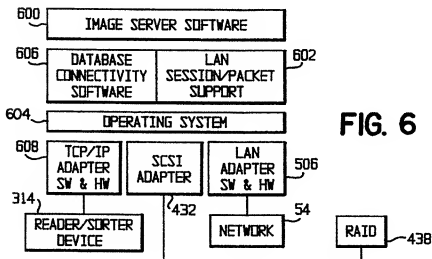


FIG. 6

FIG. 7

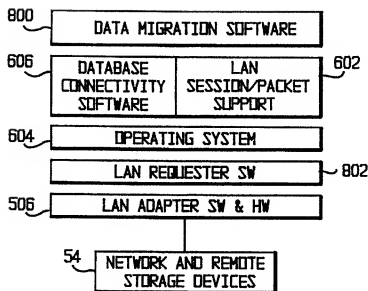
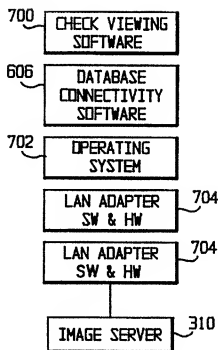
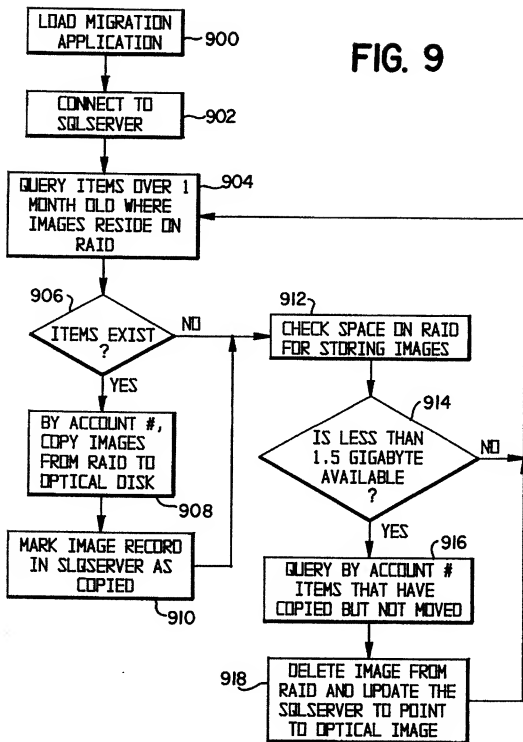


FIG. 8

FIG. 9



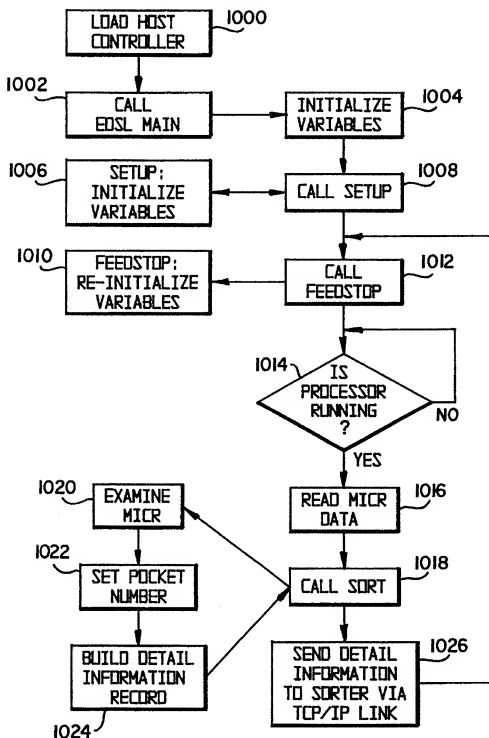


FIG. 10

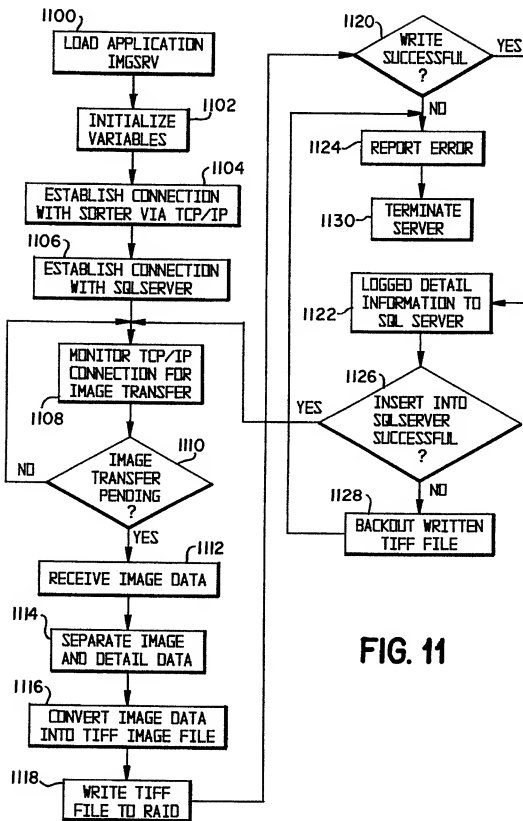


FIG. 11

METHOD OF AND APPARATUS FOR DOCUMENT DATA RECAPTURE

CROSS REFERENCE TO RELATED APPLICATION

This application is a continuation-in-part of U.S. application Ser. No. 08/237,757, filed May 4, 1994, which is a continuation-in-part of U.S. application Ser. No. 08/006,543 filed Jan. 21, 1993, now abandoned.

FIELD OF THE INVENTION

The present invention relates to a method of and an apparatus for recapturing the data from a document, and more particularly, to a method of and apparatus for recording a video image of a document for later recapture or retrieval and processing, and especially in connection with the processing of documents such as bank checks, bank deposits, and the like.

BACKGROUND OF THE INVENTION

There already exists in the art an apparatus and method used in connection with processing bank checks called MICR numbers (Magnetic Ink Character Recognition numbers). A microreader is used with a MICR number that appears at the bottom of a bank check, bank draft, or bank deposit slip in order to establish an individual bank, account number, check number, and an amount of the check or deposit slip. As part of the process of clearing the checks and the deposit slips in the bank, a machine operator in the bank types on the lower right-hand corner of the check or deposit slip the amount of the check or deposit slip in MICR numbers prior to subsequent processing. At processing time, the items are fed into a high speed reader/sorter device that reads the MICR and sorts the documents based on information read from the MICR for each individual document.

In addition to the document being read and sorted, there is often a microfilming process that produces copies of each document. Other known machines use a pair of scanners for scanning the fronts and backs of checks to record data thereon. Another known prior art apparatus and process is available from the Eastman Kodak Company of Rochester, N.Y., and is known as a Kodak Imagelink Microimager 70. That system uses mirrors to transfer the fronts and backs of bank checks to microfilm. The Kodak Imagelink Microimager 70 includes a check "locator" feature, but does not provide full check retrieval as does the present invention. Prior art machines and processes providing imaging to magnetic media retrieval capabilities are relatively expensive and are thus considered impractical and cost-prohibitive for medium and small size banks.

A significant disadvantage of the known bank check microfilm systems is the absence of a way to centrally index and recover information from the microfilm since the bank checks arrive in the system randomly and are thus processed onto the microfilm in the random order of arrival. Also, with a random order of arrival in the microfilm system, there is no practical way to process bank statements with images of checks or the checks themselves because the microfilm is of no assistance in this regard.

The present invention solves many of the problems that exist with microfilm-based systems by scanning, indexing and storing the information digitally and by using a relational model to store the information. The banking institution, using the system of the present invention, can easily

access information from a work station via a set of database queries. For instance, a user could query all checks drawn on an account over the past year.

Another known prior art apparatus does provide document capture into digital form; however, it requires expensive mainframe computers and reader/sorters to implement. Furthermore, since many of these solutions often use proprietary technology, such systems cannot be upgraded and therefore quickly become obsolete. For most banks, for example, with assets below \$150 million, that type of solution becomes cost prohibitive.

In contrast, the present invention uses networked personal computers configured to exploit standard and industry accepted client/server architectures. Such systems are easily upgraded to incorporate future software and hardware technological advancements.

SUMMARY OF THE INVENTION

The present invention overcomes the disadvantages of the prior art systems and processes by the use of an architecture which allows for an open and extensible system that provides interoperability with several different software and hardware components. For instance, a hardware abstraction layer is utilized that isolates most parts of the system from each other. That type of architecture allows different types of hardware and software to be used without impacting other parts of the system.

Using the system of the present invention, a document is fed into a reader/sorter where it passes through several devices which include a microreader followed by from and back image cameras. When the document has passed through the transport, a first computer (the host controller PC) receives the MICR data and a second computer (the image capture PC) receives the from and back images of the same document. The host controller PC then performs three important tasks. First, it communicates to the sorter/reader which pocket into which to insert the document. Second, it communicates with the image capture PC to verify the quality of the image. Third, it communicates with the image capture PC the data to be coupled with the front and back images of the document. That data usually consists of the MICR and statistical data.

At that point, the image capture PC has received the MICR and image information for a document processed through the transport. The image capture PC then stores that information to a high speed magnetic buffer. Since that cycle is capable of running at speeds ranging from 350 to 700 documents per minute, the transport PC, host controller and image capture PC are tightly coupled in order to maintain those high rates of speed.

Once the image capture PC is at idle, it compresses the captured images into CCITT Group 4 format and transfers the information from each document across a network connection to an image server. Once the image server has received the information, the information is extracted and stored in a high speed SQL relational database along with all the indexing and statistical information. At that point, the information has passed through the image server's hardware abstraction layer and is ready to be accessed by users and other parts of the system.

The users access the information via a CUA (Common User Access) compliant application. The users have several options available to them. Each user is provided with great flexibility in querying document information based on captured document information, such as MICR data and/or date.

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The information includes remaining MICR data, date, front/back images, et cetera. Users can also print or fax one or more selected images. Users can also view and transport.

The users can also magnify and/or enhance the image being viewed so as to better interpret a part of the document. Finally, the users can access online help to assist in the usage of the functions as well as customized bank policies. Using the system of the present invention, the above described functions can be accessed from either a local or remote network connection. The physical location of the retrieved image is transparent to the application and can vary from high speed magnetic disk to inexpensive helical tape.

The invention also utilizes another module that resides on the network and monitors the capacity of the image server's stored information. Its main responsibility is to allow the migration of older and less accessed images that reside on the image server onto more cost effective media for long term storage. Such storage may be a combination of magnetic, optical and/or tape media. The purpose of the migration is to keep the current and more often accessed images on the image server's faster fault tolerant magnetic disk array for quick access by users and other applications.

Another module of the present invention that also resides on the network is responsible for printing customer statements based on information that resides on the image server. That module prints out a statement that contains a transaction listing and balance information followed by copies of each image processed during that statement cycle. The number of images that are printed on each page may be specified by the institution which will attempt to maximize the number in order to minimize the cost of postage. For instance, to print 16 images at four images per page requires four pages, whereas 16 images at 16 images per page would require only one page. The institution can also provide input as to the design of the statement layout. Due to the volume of statements to print, a dynamic load monitoring algorithm is used to balance the load placed on multiple printer configurations.

Another feature of the present invention is the ability to access the system remotely in order to access documents stored at a remote location. That feature is of particular interest to institutions for which documents are processed via a third party. That feature uses standard network access protocols using TCP/IP, IPX and/or NETBIOS and high speed modems.

BRIEF DESCRIPTION OF THE DRAWINGS

The drawing figures are block diagrams illustrating the system of the present invention.

FIG. 1 is a schematic block diagram illustrating the system of the present invention;

FIG. 2 is a schematic block diagram of a computer network system of a bank that employs the system of the present invention;

FIG. 3 is a drawing of a schematic block diagram of an alternative and preferred embodiment of the present invention;

FIG. 4 is a drawing of a schematic diagram of a preferred hardware embodiment of the system of the present invention;

FIG. 5 is a block diagram of the various software components which are used in connection with the operation of the reader/sorter host controller component of the system of the present invention;

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FIG. 6 is a block diagram of the image server module software used with the system of the present invention;

FIG. 7 is a block diagram of the item/check viewing module used in connection with the system of the present invention;

FIG. 8 is a block diagram of the data migration module which is used in connection with the system of the present invention;

FIG. 9 is a diagram of a flow chart of the data migration module used in connection with the preferred embodiment of the invention;

FIG. 10 is a diagram of a flow chart of the host controller module used in connection with the preferred embodiment of the present invention; and

FIG. 11 is a diagram of a flow chart of the image server module used in connection with the preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

Referring now to FIG. 1 of the drawings, there is shown in block diagram form an embodiment of the apparatus and method of the system of the invention which is designated generally by reference numeral 10. This embodiment is directed to the processing of conventional bank checks and deposit slips which typically have magnetic ink characters or MICR numbers (Magnetic Ink Character Recognition numbers) along the lower front surface thereof. In system 10, the bank checks are individually transported face up and end to end at speeds of 350 or 700 per minute and even considerably faster speeds along known transport path means 12 by a document processor 13 incorporating a document feed apparatus 36 and a document transport microreader 14.

When processing checks, cash tickets and deposit slips, the document transport 14 or document feed apparatus 36 assigns a unique sequential document number to each check and deposit slip, reports (16) information as to whether or not the document processor 13 is on or off, and also reports (17) information as to how fast the document processor 13 is running to the image sample computer 18 (PC 18), which is equipped with EDLS (Extended Data Sorting Language) software. EDLS is available, for example, from BTI Systems, Inc., of Oklahoma City, Okla., as is the transport path device 12 and the document processor 13. The PC 18 is also known as the host controller 18.

Typically, the checks and/or deposit slips are next transported past an MICR number microreader 20 for reading the magnetic ink characters on the bank checks and deposit slips and also feeding (21) MICR number information to the host controller 18. The checks are then transported past the image capturing devices or cameras 22, 24, which are positioned along the document transport path 12, and which are typically positioned in the path of travel with one slightly before the other, to capture video images of the fronts and backs of each bank check or document being processed. Preferably, the image capturing devices 22, 24, comprise two video cameras with digitized output that typically take pictures in slices of approximately one-half of an inch at a time.

The digital outputs of the front and rear image capturing devices 22, 24 are transmitted to two image capture boards or PIC1 (PC capture interface) boards located in the image capture computer 26 (the PC 26). One form of image capture board that is currently available is capable of placing "captured" data on 8086/8088 processor family media, which

family media comprises magnetic discs and laser optical discs. Laser optical discs are used in the preferred embodiment of the present invention.

The image capture computer 26 may be an IBM AT class 486 personal computer, for example, and the computer 26 is also equipped with compression board software manufactured by, for example, BTI Systems, Inc. The host controller 18 is also equipped with a printed circuit board which allows it to interface with the document processor 13. One available printed circuit board to perform that interface function is the PC OEMI circuit board, also manufactured by BTI Systems, Inc.

The image capture boards in the image capture PC 26 receive (34) the unique sequential document number assigned by the document transport 14 along with the digitized images of the fronts (30) and the digitized images of the backs (32) of the checks or other documents being processed. In the image capture PC 26, the transmitted MICR number (21, 34) is added to the compressed image of each check with each check's associated unique sequential document number by an ALCRON compression board, available from Alacron, of Nashua, N.H., which combines the images of the fronts and backs of the checks from the image capture boards with the MICR numbers and the unique sequential document numbers and stores them on the magnetic disc of the image capture PC 26. The combined images are transmitted from the image capture PC 26 to an optical disc autochanger or "jukebox" 46 through the computer optical server 44.

As noted, the MICR number which has been previously read by the MICR number microreader 20 and stored in the host controller 18 is transferred (34) from the host controller 18 by interaction of the image capture PC 26 and the host controller 18.

Should the document feed 36 and document processor 13 begin feeding checks past the image cameras 22, 24, either too fast or too slow for the image capture PC 26 to be able to properly function and record the compressed images of each check along with each check's unique sequential document number and MICR number, the image capture computer PC 26, which is equipped with the PC OEMI interfacing software, also performs an operating speed control function by feeding a speed control signal (38) back to the host controller 18 using the EDLS and image sample software. The host controller 18 in turn feeds the speed control signal (40) back to the document transport 14, where the appropriate increase or decrease in the speed of the document processor 13, and thus, the travel of the checks along the transport path 12, is accomplished.

After the checks have passed the image cameras 22, 24, they proceed to a document stacker 42. All necessary information to handle a customer's bank statements and bank accounts in the practice of the present invention is now stored in the image capture PC 26. In prior art systems, if the actual checks themselves are needed or desired in a particular bank customer's case, the checks would be run through an available MICR number sorter for a few sorting cycles. However, in the system of the present invention, no additional equipment is required because one simply disengages the image cameras 22, 24, and runs the checks gathered in the document stacker 42 through the document processor 13 again—possibly several times—in order to sort the checks using MICR numbers. The document processor 13 may be a Model 90690 Document Processor manufactured by BTI Systems, Inc. The document sorter could, for example, be set to sort by bank account number. Alternatively, the checks

could be sorted electronically by MICR number, bank account number, etc.

The output of bank statements for bank customers by the present system is such that an individual bank may utilize check imaging statements that include approximately 10 to 20 check images per page to avoid the necessity of returning the actual cancelled checks to the bank's customers. By the use of such "truncated check imaging statements", as they are referred to in the art, the necessity of a relatively high level of manual labor in filing checks and deposit slips is eliminated and the postage expense for a small bank can be cut dramatically. One established vendor estimates that image processing and "image statements" of checks can reduce a bank's postage expense 40% to 60% while simultaneously reducing labor costs and improving productivity and customer service.

Additionally, the checks processed with the present system all automatically come out in check number order on the imaged bank statements, thereby providing additional acceptability to customers and satisfying a long-felt need. Check imaging statements are presently available using relatively expensive machines and systems, but the cost of providing those advantages to bank customers for small and medium-sized banks is so prohibitive that small and medium-sized banks do not, as a rule, offer such a service to banking customers.

The processed image information stored on the magnetic disc in the image capture PC 26 is formatted and written to the optical autochanger or "jukebox" 46 through the computer optical server 44 for long term storage and retrieval purposes by, for example, bank employees seeking to directly serve the special request needs of a bank's customers. The optical autochanger 46 may preferably be a WORM or other optical storage device.

In practice, bank employees may perform a number of special request customer-related and operations-related functions by accessing the autochanger 46 through the optical server 44.

Referring now to FIG. 2 of the drawings, there is shown in block diagram form an embodiment of the system of the invention in which individual computer research stations 48, 50, 52, representing the work stations of various bank employees, are provided access to the information stored in the optical autochanger 46 through a computer network 54, such as a Novell brand computer network. If a particular bank customer calls in and asks for a print-out of only certain checks or only a portion of a certain bank statement that, for example, the customer has misplaced, the operator of the research station 48, for example, can perform that task from the operator's work station. Using the laser printer 56, the operator can print and mail the customer the print-out without ever leaving the work station and without having to conduct hours of research or requiring the assistance of another employee for hours of research. Most small and medium-sized banks presently perform this type of special request search by an extremely time consuming "by hand" search of the microfilm records in the name of, and for the sake of, "customer service". On the other hand, some banks charge the customer for such customized services, but the manual labor and those costs are relatively high, thereby leading to customer dissatisfaction.

Utilizing the present invention, other bank customers having particularized needs and who want customized services, such as a copy of that day's checks faxed to them at the close of each day, or each week, or each month, can be provided with the information they seek virtually on-line by

facsimile transmission 58 sourced in the optical autochanger 46 through the optical server 44 and through the computer network 54.

FIG. 3 is a schematic block diagram of an alternative and preferred embodiment of the present invention. In the preferred alternate embodiment of the present invention, a network 54 is also utilized. Connected to that network 54 is a plurality of check viewer stations 300-306 used to gain access to and/or to communicate with any of the other devices connected to the network 54. For example, the check viewer research station 300 can be used to view checks as previously described in connection with the first embodiment of the system of the present invention. The image server 310, in addition to performing as the server connection between the reader/sorter 314 and the network 54, retains primary responsibility for the data migration module. The function of the data migration module is to interrogate the system's data storage resources and migrate aging and less-accessed information onto other, usually less expensive, media. A diagram of the flow chart of the data migration module is shown in FIG. 9.

Also connected to the network 54 is a customer service representative (CSR) station 302 and a teller check viewer station 306. Those work stations 302 and 306 allow the user to access item information contained in the system of the present invention by utilizing the network 54. Such item information includes the MICR and the images associated with each MICR. Any of the check viewer work stations 300-306 may be connected to a printer, such as printer 316 connected to the teller check viewer work station 306, for the purpose of printing out information from the system of the present invention.

The fourth check viewer work station 304 shown in FIG. 3 functions in the same manner as the check viewer work stations 302-306, and may optionally include a scanner 318 for the purpose of scanning data into the system of the present invention. As previously described in connection with the work stations 48, 50 and 52, each of the work stations 300-306 may be an IBM AT-class personal computer having a 486 family microprocessor and the appropriate amount of volatile and nonvolatile memory.

Also connected to the network 54 is an image server PC 310 which may also function as a check viewing work station, in addition to handling the data migration functions. The image server work station 310 may optionally be connected to a mainframe computer 308 in order to connect the network 54 to, for example, an existing mainframe computer of a bank or other financial institution.

A reader/sorter device 314 is provided for reading the checks and sorting them as described in connection with the first embodiment of the system of the present invention. The reader/sorter device 314 is controlled by a reader/sorter host controller 312. The output from the reader/sorter device 314 is provided to the image server 310 for storage and manipulation, and for other purposes as described in the application, as will be known to those of ordinary skill in the art.

FIG. 4 is a schematic diagram of a preferred hardware embodiment of the document data recapture system of the present invention. In order to use the system, a document transport 402, which may be a BTI model 90690, 91690 or 94690 document transport, available from BTI Systems, Inc. of Oklahoma City, Okla. 73174, is started and performs internal tests for hardware failures. If all tests pass, the document transport 402 enters an OFFLINE mode. Associated with and forming a part of the document transport system are a microreader 404, deskewing drums 406, front

and back image cameras 408, and one or more stacker modules 410.

Next, an image capture PC 420 is started and establishes communication with the image modules associated with the front and back image cameras 408 and transport system 402, utilizing two PCI boards 422. The image capture PC 420 utilizes such PCI boards 422 in order to transmit front and back uncompressed images of each of the checks being viewed by the cameras to the image capture PC 420.

The host controller PC 414 is then started and the host controller software is loaded. The host controller software attempts to establish a connection with the document transport system 402. Communication takes place using a POZI adapter 418, which is also available from BTI Systems, Inc., and which resides in the host controller 312. The POZI board 418 is attached to the bus of the host controller PC 414 and communicates with the document transport system 402, and specifically with the microreader module 404 of the document transport system 402. The POZI board is accessed using known RS-422 drivers and receivers. Such access must be fast, however, because once the MICR data is sent to the controller 312, there is only approximately 50 milliseconds time within which the controller 312 must respond back to the document transport system 402 indicating to which pocket a subject document is to be inserted.

When the host controller 312 establishes an ONLINE connection with the document transport 402, it then establishes a connection with the image capture PC 420 by means of the TCP/IP Ethernet connectors 416 and 424. Once the operator changes the mode of the document transport system 402 to ONLINE, using the keypad 412 of the document transport system 402, the host controller 312 can then communicate directly with the document transport system 402 using predefined commands. The connection of the host controller 312 by means of the POZI board 418 to the microcode reader 404 of the document transport system 402, allows the host controller 312 to receive MICR information as the documents are passed through the microcode reader 404 of the document transport system 402. The host controller 312 then examines the data and sends back to the document transport system 402 information such as into which pocket of the stacker module 410 the document should be sorted.

Additionally, the data received from the microcode reader 404, the selected pocket number of the stacker module 410 and other data is also broadcast by means of the TCP/IP Ethernet board 416 connection to the like Ethernet board 424 associated with the image capture PC 420. Such connections consist of a 10BaseT Ethernet connection using TCP/IP protocol support for messaging services. That connection allows the host controller 312 to send microreader information to the image capture PC 420 where the data will be associated with its corresponding uncompressed front and back image data.

Further, the image capture PC 420 establishes a connection with the image server 310 by means of a second TCP/IP Ethernet board 426, which is connected to a like Ethernet adapter 436 which forms part of the image server 310. Such connection allows the image capture PC 420 to send the MICR data, front and back images, and other detailed data, to the image server 310 for longer term storage.

As shown in FIG. 4, the image server 310 includes as components an image server PC 428, an SQL relational database server 430, an SCSI adapter 432, a second TCP/IP Ethernet adapter 434 which connects the image server PC 428 to the local area network 54, and the previously dis-

cussed first Ethernet adapter 436. Also, a magnetic disk array 438 is connected by means of the SCSI adapter 432 to the image server 310 for long term storage purposes.

In order to process documents, the system of the present invention is turned on and all of the connections described above are established. Then, one or more documents are fed into the document transport system 402 and the feed button located on the document transport system 402 is depressed. If the host controller 312 is ready, the document transport 402 will begin feeding the documents. Each document will first be straightened using a first one of the deskewing drums 406 located on the side of the document transport system 402. Then, each document passes through the microreader 404 which reads the MICR information and sends it to the host controller 312 by means of the POZI board 418, as previously discussed. The host controller PC 414 of the host controller 312 receives the MICR data by means of the POZI board 418, determines which pocket of the stacker module 410 the document is to be inserted into, and then sends that information back to the information transport system 314, again by means of the POZI board 418.

The host controller PC 414 also sends the MICR and related detailed information to the image capture system 400. That data is communicated by means of the Ethernet adapters 416 and 424 associated respectively with the host controller PC 414 and the image capture PC 420. The MICR data and other detailed information received at the image capture PC 420 is queued for later use.

After the read document exits the microreader 404, it is passed through a second deskewing drum 406, where it is straightened out before being imaged. The front and back image cameras 408 then take digital pictures of the document and transmit those images to the image capture PC 420 by means of the two PCI boards 422, as previously discussed. The front and back images transmitted to the image capture PC 420 are also queued for later processing.

Once the image capture PC 420 is not busy receiving images, the queued MICR data and its corresponding front and back image data are merged together and stored in a magnetic disk buffer or other type of storage medium. During periods where the image capture PC 420 is idle, those images are transmitted by means of the second Ethernet adapter card 426 to a like Ethernet adapter card 436 which forms part of the image server 310. Those images are stored by the image server 310 for more permanent storage on a large capacity magnetic disk array 438, which is controlled by means of the SCSI adapter 432 which also forms part of the image server 310 and which is connected to the bus of the image server PC 428.

When the image capture PC 420 transmits the MICR and image information to the image server PC 428, the transmitted item is removed from the magnetic storage buffer of the image capture PC 420. The image server 310 then extracts the information received from the image capture PC 420, converts the front and back images to a multi-page TIFF Version 6 image file and stores it on the magnetic disk array 438.

The image server 310 then takes the MICR and other detailed data, and indexes it in an SQL database using the SQL relational database server 430. It is stored in the SQL database, together with the name of the image file stored in the magnetic disk array 438. The name of the image file of the corresponding front and back images of the MICR number serves as a pointer to the image file when accessed.

The above-described sequence is repeated for every document that passes through the document transport system

402. The detailed information for each document that is inserted into the SQL database contained on the database server 430 includes such information as the pocket ID, length, MICR fields, date, sequence number, et cetera. In addition, the pocket ID number is used to identify which documents were rejected and are thus in need of repair. At that point, the document has passed through the hardware abstraction layer. Various application software can be used to access document information by means of the local area network 54.

Referring now to FIG. 5, there is shown in block diagram form the various software and hardware components which are used in connection with the operation of the reader/sorter host controller 312. The data processing controller/host module 312 which is schematically shown in FIG. 5 allows users to control the various features of a specific document processor use, such as the reader/sorter device 314.

The DP controller/host module 312 is formed from a variety of components, such as the reader/sorter host controller software 500, which is shown in block diagram flow chart form in FIG. 10. The reader/sorter host controller software 500 may preferably be GW/CHOST software, available from Greenway Corporation of Carrollton, Ga. The DP controller/host module 312 also includes the BTI reader/sorter host controller software interface 501, which may preferably be EDSSL (Extended Data Sorter Language), available from BTI Systems, Inc. The operating system 502 of the controller or host module, may preferably be the DOS and OS/2 operating systems, available from IBM Corporation. Also included as part of the controller host module 312 is the network session/packet support software 504, which preferably be FTP TCP/IP, DOS/OS/2 software, available from FTP Software, Inc. of North Andover, Mass. The LAN adaptor software and hardware 506, may preferably be an SMC Elite 16 Ethernet adapter, available from Standard Microsystems Corporation, of Hauppauge, N.Y. The reader/sorter hardware and software adapter support component 508, which is a POZI adaptor, available from BTI Systems, Inc., also forms a part of the DP controller/host module 312. The reader/sorter device 314 is connected to both the reader/sorter adapter support component 508 and to the LAN adapter module 506.

In operation, the DP controller/host module 312 is used to define the various sort methods desired, as well as to insert item separators from the merge/feeder function. The DP controller/host module 312 is used to select which devices to use, such as the imaging cameras, the MICR reader, an inkjet printer, et cetera. Console errors are displayed in a user-friendly format, which also provides suggestions for the recovery of errors.

The DP controller/host module 312 also sends the MICR data and other information to the image server 310, and, as previously described, gathers information to be sent to the image server 310 and identifies individual check runs and check batches. The DP controller/host module 312 has the ability to insert separators after a certain amount of checks are written into a pocket and to identify a batch header and other special items.

Finally, the DP controller/host module 312 is used to reset the sequence number at the beginning of a new check run as well as to parse MICR data in order to identify the various fields, such as Aux, Onus, the FRB number, the amount of the check, et cetera.

The operation of the host controller module software is shown in diagrammatic flow chart form in FIG. 10. The host controller 312 is first loaded at step 1000 and then the EDSSL

Extended Sorter Language software used to control the sorter/reader device 314 is called at step 1002. The variables are initialized at step 1004 and then the Setup program is called at step 1008. The Setup module then initializes additional variables at step 1006. The Feedstop module is then called at step 1012, which then reinitializes the variables at step 1010. A determination is then made at step 1014 of whether the reader/sorter device 314 is running. If it is not, the program waits until it determines an affirmative response at step 1014.

Once an affirmative response is detected at step 1014, the MICR data 1016 is read from the microreader 404 of the reader/sorter device 314 and then the EDSL Main program calls the Sort subroutine at step 1018. The Sort subroutine then examines the MICR code read at step 1020, sets the pocket number for that document at step 1022 and then builds the detail of the information record read at step 1024. The EDSL Main program then returns to step 1018 and sends the detailed information to the reader/sorter 314 by means of the TCP/IP Ethernet link formed by the Ethernet adapters 416 and 424. The host controller module then jumps to begin executing with step 1012 to again call the Feedstop subroutine and execute steps 1010-1026, as previously discussed, in order to read the next document.

FIG. 6 illustrates, in block diagram form, the hardware and software components used to operate the image server 310. FIG. 11 shows in diagrammatic flow chart form the image server software 600 used to operate the image server 310. The primary responsibility of the image server software 600 is to accept the MICR and image information from the reader/sorter device 314, convert it into a common format, and then store the converted information. Converting the information to a common format isolates the item/check viewing software from the reader/sorter 314 device installed at a particular installation.

As previously discussed, the MICR item information is then stored in an SQL client/server database 430. The images are stored in files that reside on a file system. Such a file system may reside on optical, helical or magnetic media.

Turning now to the specific components of the image server module, the first component is the image server software 600, which may preferably be IMGSRV, available from Greenway Corporation. ALAN session/packet support 602 and database connector 606 are also provided. The database connectivity software 606 may preferably be the ODBC (Open Data Base Connectivity) and Database Library Software, available from Microsoft Corporation of Redmond, Washington. The LAN sessions/packet support software may preferably be Novell 4.0x for OS/2 Requester, available from Novell Corporation of Provo, Utah. In addition, the operating software system 604 necessary in order to operate the image server 310 is also contained in the image server module. That software is preferably the DOS and OS/2 operating system software, available from IBM Corporation of Armonk, N.Y. Finally, as previously discussed, the LAN adapter software and hardware 506 is used to connect the image server 310 to the network 54, and to the reader/sorter device 314. The LAN adapter software and hardware 506 may preferably be an Eagle EP3210ESIA Ethernet Adaptor, available from Eagle Technology of San Fernando, Calif.

The image server module shown in FIG. 6 utilizes TCP/IP adaptor software and hardware 608, which is used to connect the image server module to the reader/sorter device 314. The TCP/IP adaptor hardware and software support is provided

by an SMC Elite 16 Ethernet adaptor, as previously described, while the TCP/IP packet/session support software used with that adaptor may preferably be TCP/IP OS2 Base software, available from IBM Corporation. In addition to being able to communicate with the reader/sorter 314 and the network 54, the image server module is also designed to be able to store data in a magnetic disk array, such as a RAID 438, which may preferably be obtained from Micropolis of Chatsworth, Calif. The SCSI Adaptor 432, which may be a model 1740 Adaptec SCSI adaptor available from Adaptec of Milpitas, Calif., is utilized to provide the communication link between the image server module and the RAID storage device 438.

The image server module performs various functions in connection with the data document recapture system of the present invention. First, it services insert requests from the reader/sorter device 314 and then inserts records into a database. The image server module communicates with different databases by means of SQL or ODBC protocol. In addition, the image server module functions to store check run data in an intermediate storage location for modification by the user. For example, rejected items and entries that raise an exception based upon image quality characteristics may be viewed and modified by a user for subsequent storage.

The image server module also services requests by clients for the retrieval of specific images, as previously discussed. In addition, the module maintains a database of current customer information. In that manner, it provides additional search capability and statement information functions. The image server module also provides database archival/backup support for database optimization and reorganization in order to improve database performance as well as to provide maintenance for the database. Finally, the image server module uploads completed and approved check information to the host computer system 308.

In operation, the image server module first loads the image server software IMGSRV at step 1100, initializes variables at step 1102 and then establishes a connection with the reader/sorter 314 by means of the TCP/IP adaptor 608, at step 1104. Next, a connection with the SQL server 430 is established at step 1106. The image server IMGSRV software then monitors the TCP/IP connection 608 for an image transfer at step 1108.

A determination is then made at step 1110 of whether an image transfer is pending. If a negative determination is made at step 1110, then the program returns to continue monitoring the TCP/IP connection at step 1108. If an affirmative determination is made at step 1110, then the program receives the image data at step 1112, separates the image and detail data at step 1114 and then converts the image data into a TIFF Image file at step 1116. Then, at step 1118, the TIFF file is written to the RAID magnetic disk array 438.

A determination is then made at step 1120 of whether the write operation to the RAID magnetic disk array 438 has been successful. If a negative determination is made at step 1120, then an error is reported to the user at step 1124 and the connection to the SQL server 430 is terminated at step 1130.

If an affirmative determination is made at step 1120, then the detailed information is logged to the SQL server 430 at step 1122 and a determination is then made of whether the data insert into the SQL server 430 has been successful at step 1126. If an affirmative determination is made at step 1126, then the program returns to again monitor the TCP/IP adaptor connection at step 1108 for an image transfer. If a negative determination is made at step 1126, then the written

TIFF file is backed out at step 1128 and an error is reported at step 1124. The connection to the SQL server 430 is then terminated at step 1130.

The item/check viewing module, which may operate, for example, on the work stations 300-306, is shown in block diagram form in FIG. 7. The function of the item/check viewing module in its item viewing application it to allow the users to access viewing information, which includes the MICR number and its associated images. In addition, various reports can be generated using this module. The information used to generate the reports, as well as the MICR number and its associated images, is accessed by means of the client/server database.

The item/check viewing module includes viewing software 700, which may preferably be ITEMS Software, available from Greenway Corporation, the database connectivity software 606, the operating system software 702 for the work station and the LAN adapter software/hardware 704. The operating system software 702 may preferably be Microsoft Windows 3.1, available from Microsoft Corporation. The LAN adaptor software/hardware 704 may preferably be an Eagle NE 2000 Ethernet Adaptor, available from Eagle Technology. Novell 4.0x software may be used for the network packet/session support software. As previously discussed, each of the work stations 300-306 is connected by means of the network 54 to the image server 310.

The check viewing software 700 also allows the work station to flip between the front and back images of a check or to show the front and back images simultaneously. It allows the user to magnify a part of the check and to fax or print one or more checks to a destination connected to the network 54 with an attached note or a cover letter. The most commonly used functions are controlled by speed keys and/or a tool bar.

The check viewing software 700 of the item/check viewing module provides the user with the ability to access Onus items via the account number, amount, the check number, the date sequence number, the check run, the check batch, et cetera, as well as the ability to access foreign items by means of the routing number, the amount, sequence number, the date, the check run, et cetera. The check viewing software 700 provides image window support, as well as the ability to support in a folder a set of images from different queries. That function allows the user to gather a group of checks for printing, faxing or totalling.

The item/check viewing module has the ability to communicate with the image database in a non-specific database format. For example, the database access would be SQL or ODBC protocol. The item/check viewing module further allows the user to print a check run report which contains pocket totals and end counts, to print an end-of-day report and the ability to repair document rejects. The repair of document rejects involves entering the defective MICR data, rotating a check, or rescanning it. In addition, using the check viewing Software 700, the user is able to look at previously corrected items, and to easily list and correct all rejected items.

The data migration module, a block diagram of which is shown in FIG. 8, may be installed on one or more of the work stations, such as work station 310 shown in FIG. 3. The primary responsibility of the data migration module is to interrogate the system resources and to migrate less-accessed information onto other, and usually less expensive, storage media. The data migration module is aware of the migration path and periodically monitors higher level resources and migrates data to the then next lower level

resources during periods when activity on the network 54 is low and the higher level data resources begin to approach maximum capacity.

The data migration module includes data migration software 800, which is installed on the work station 310. The IMGSRV Software from Greenway Corporation includes a data migration component, a diagram of the flow chart of which is shown in FIG. 9. It also includes LAN session/packet support software 602 and database connectivity software 606.

The data migration module further includes operating system software 604 for performing the basic functions of the work station 310, as well as LAN requester software 802, which may preferably be Novell 4.0x for OS/2. Requester, available from Novell Corporation. ALAN adapter software/hardware 506 is also utilized. The TCP/IP OS/2 Base Software available from IBM Corporation is preferably used for TCP/IP packet/session support software. As previously described, the work station 310, or any other work station which includes the data migration module such that it performs data migration functions, is connected to the network 54 and from that to remote storage devices, such as the RAID 438.

Referring now to FIG. 9, the data migration application of the IMGSRV software is loaded at step 900 and then a connection to the SQL server 430 is established at step 902. Then, a query of items over one month old of which images reside on the RAID magnetic disk array 438 is made at step 904. If a negative determination is made that such items exist at step 906, then the data migration software goes to step 912.

If an affirmative determination is made at step 906 that such items exist, then the images are copied, by account number, from the RAID magnetic disk array 438 to an optical disk (not shown), at step 908. The image record in the SQL server 430 is then marked as copied at step 910 and then a check is made for available space on the RAID magnetic storage device 438, at step 912.

At step 914, a determination is made of whether there is less than 1.5 gigabytes of available space in the RAID magnetic storage device 438. If a negative determination is made at step 914, then the data migration application software jumps to step 904 and continues to process additional items over one month old. If an affirmative determination is made at step 914, then a query is made by account number for items that have been copied from the RAID 438 onto the optical disk but have not been moved, at step 916. Then, the images corresponding to the account numbers that have been copied but not moved are deleted from the RAID magnetic storage device 438 at step 918 and the database contained in the SQL server 430 is updated to point to the optical image stored on the optical disk.

Using the above-described procedure, the system of the present invention need preferably only archive items stored on the RAID magnetic storage device 438 once per month. Thus, each customer's checks, deposit slips and cash tickets and bank statement can all be transferred to an optical disk in such a manner that such records are stored on the optical disk with the checks sorted by number or other criteria and preferably in a location contiguous to the customer's monthly bank statement, cash tickets and deposit slips. An additional advantage over prior art systems is then achieved since the system of the present invention is able to electronically sort checks by MICR number or other criteria and then store them in the desired order.

Although certain presently preferred embodiments of the invention have been described herein, it will be apparent to

those skilled in the art to which the invention pertains that variations and modifications of the described embodiments may be made without departing from the spirit and scope of the invention. Accordingly, it is intended that the invention be limited only to the extent required by the appended claims and the applicable rules of law.

What we claim is:

1. A system for processing a plurality of individual documents, each having a front and a back with images thereon, comprising:

a document transport system for transporting the individual documents along a transport path for reading MICR data on each document, and said document transport system further including at least one camera for producing images of the front and back of the individual documents;

a first digital data processor connected to said document transport system for receiving said MICR data and a sequential document number for each document;

a second digital data processor, said second digital data processor being connected to said first digital data processor so that said first digital data processor communicates said MICR data and sequential document number to said second digital data processor, said second digital data processor also being connected to said document transport system for receiving said images of said front and back of each individual document, and for merging said MICR data and sequential document number with said images to form merged images, said second digital data processor further communicating speed control data to said first digital data processor for use by said first digital data processor to control said document transport system to a desired speed; and

a third digital data processor connected to said second digital data processor for receiving said merged images of each document and for indexing and permanently storing said merged images for later retrieval.

2. The system of claim 1, wherein said first digital data processor generates detailed document data for each of said documents and transmits said detailed document data to both said document transport system and said second digital data processor.

3. The system of claim 2, wherein said detailed document data is transmitted by said second digital data processor to said third digital data processor and is used by said third digital data processor when indexing and permanently storing said merged images of said individual documents.

4. The system of claim 1, wherein said third digital data processor includes a relational database server which stores pointers for indexing said merged images.

5. A method for processing a plurality of individual documents, each having a front and a back with images thereon, comprising the steps of:

transporting each individual document along a transport path and obtaining MICR data and front and back

image information associated with each individual document;

transmitting said MICR data and sequential document data to a first digital data processor for controlling the transporting of each individual document along said transport path;

transmitting said MICR and sequential document data from said first digital data processor to a second digital data processor;

transmitting said image information associated with each individual document to said second digital data processor;

merging said transmitted MICR and sequential document data and said image information in digitized form into merged images of the front and back of each individual document;

transmitting speed control data between said first and second digital data processors for use by said first digital data processor to control said document transporter to a desired speed;

transmitting said merged images of each individual document from said second digital data processor to a third digital data processor; and

indexing and permanently storing for later retrieval said merged images of each individual document using said third digital data processor.

6. The method of claim 5, further including the step of storing temporarily said merged images of each individual document in said second digital data processor.

7. The method of claim 5, wherein said step of transporting each individual document along a transport path is performed by a document transport system.

8. The method of claim 7, further including the step of generating detailed document data using said first digital data processor for each of said individual documents and transmitting said detailed document data to both said document transport system and said second digital data processor.

9. The method of claim 8, further including the step of using said detailed document data when indexing and permanently storing said merged images.

10. The method of claim 5, wherein said third digital data processor utilizes a relational database server which stores pointers for indexing said merged documents.

11. The method of claim 5, further including the step of using said third digital data processor to determine the quantity of permanently stored merged images and to delete some of said permanently stored merged images to maintain a certain predetermined maximum quantity of permanently stored merged images.

12. The method of claim 11, further including the step of transferring said permanently stored merged images to be deleted for permanent storage in another location prior to deleting said permanently stored merged images.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 5,602,936
DATED : February 11, 1997
INVENTOR(S) : Green et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 2, line 31, change "from" to --front--.

Column 11, line 44, change "ALAN" to --A LAN--.

Column 12, line 3, change "OS2" to --OS/2--.

Column 13, line 7, change "it" to --is--;

line 29, change "from" to --front--; and

line 55, change "Software" to --software--.

Column 14, line 15, change "ALAN" to --A LAN--.

Signed and Sealed this
Thirteenth Day of May, 1997

Attest:



BRUCE LEHMAN

Attesting Officer

Commissioner of Patents and Trademarks